

**BEFORE THE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BENCH, KOLKATA  
ORIGINAL APPLICATION NO. ~~126~~<sup>126</sup>-OF 2026**

**IN THE MATTER OF**

Kailash Chandra Nayak ...Applicant

Versus

State of Odisha & Others ...Respondents

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PLACE: Bhubaneswar

DATE: 04/04/2026

SANKAR PRASAD PANI

ASHUTOSH PADHY

ADVOCATE'S

Plot 2132/4814, NageswarTangi, Bhubaneswar 751002 Cell-9437279278, Email:  
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## SYNOPSIS

That the present application is filed challenging the illegal and unscientific management of over Burden dumps by the private Respondent viz. M/s Balasore Alloys Ltd. Further the direct discharge of untreated runoff water to the Damsala nala and thereby contamination of Surface water and Ground Water with Hexavalent Chromium, a carcinogenic substance leading to health hazards in the locality.

Further on dated 09/12/2025 State pollution Control Board issued one direction to the Respondent Unit directing to maintain the water quality of Damsala Nallah and directed to take adequate treatment of mine drainage discharge / Surface runoff through ETP before discharging to Damsala Nallah.

That in the month of June 2025, the Ministry of Jal Shakti conducted an inspection of Ground Water Quality in Sukinda Valley, Jajpur District, Odisha and **higher concentration of chromium was found in ground water.** The Sukinda Valley area has **phreatic aquifer up to a depth of 30 meter below ground level followed by fractured deeper aquifer.** A total number of **233 samples were collected** from the study area and analysed. The samples were collected from hand pumps, dug wells, Effluent Treatment Plant (ETP) mine pits, Damsala Nala and Brahmani River. In addition to these groundwater samples, samples were also collected from surface water body (pond, spring and river), to assess the quality. **Out of 233 samples, 37 samples have shown higher concentration of chromium (VI) above 0.05 mg/l during pre-monsoon and 28 locations have shown chromium (VI) above 0.05 mg/l during post-monsoon season.**

## LIST OF DATES

- |            |   |
|------------|---|
| 22/08/2014 | the Respondent Company got environmental clearance for Underground Chromite Mine in Village Kaliapani, Tehsil, Sukinda, District Jajpur, Orissa (64.463 ha) (expansion from 0.42 MTPA to 0.6 MTPA and change in technology from opencast to opencast and underground).                                  |
| 15/12/2014 | One corrigendum environmental clearance has been granted in favor of the Private Respondent.  |
| 20/01/2025 | One amendment environmental clearance has been granted in favor of M/s Balasore Alloys Ltd. for Proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village Kaliapani, Tahasil- Sukinda, District Jajpur in addition to the |

existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines (ML. area:64.463Ha) located in Village Kaliapani, Tahasil-Sukinda District Jajpur.

- 01/02/2025 Consent to operate has been granted in favor of the private respondent for production of 0.6 MTPA Chrome Ore (ROM) and handling/processing of COB Plant of Capacity 1 x 20 TPH.
- June 2025 Ministry of Jal Shakti conducted an inspection of Ground Water Quality in Sukinda Valley, Jajpur District, Odisha
- 09/12/2025 SPCB issued one direction to the Respondent Unit.
- 13/03/2026 Photographs taken by Applicant suggesting direct discharge of polluted water into the Damsala Nallah by Private Respondent.

**BEFORE THE NATIONAL GREEN TRIBUNAL****EASTERN ZONE BENCH, KOLAKATA**

(Under Section 18(1) read with Section 14(1), 15, 20 of  
the National Green Tribunal Act 2010)

Original Application No \_\_\_\_\_/2026

**IN THE MATTER OF:**

**Kailash Chandra Nayak**, C/o- Chakradhara Nayak, At/Po-  
Nuadihi, PS- Sukinda, Dist- Jajpur, Odisha, 755018 ...

APPLICANT

**VERSUS**

1. **State of Odisha** represented by Chief Secretary, Government of Odisha,  
Lokaseva Bhawan, 751001 Bhubaneswar [csori@nic.in](mailto:csori@nic.in)
2. **District Collector, JAJPUR**, At/Po/Dist-JAJPUR, Odisha, 755001,  
[dm-jajpur@nic.in](mailto:dm-jajpur@nic.in)
3. **Divisional Forest Office**, Cuttack Forest Division, At/po- Balisahi,  
Government Press Employee Quarters, Cuttack, Odisha 753012,  
Email- [dfo.cuttack@odisha.gov.in](mailto:dfo.cuttack@odisha.gov.in)
4. **Member Secretary**, Odisha State Pollution Control Board A/118, Unit-  
VII, Nilakantha Nagar, Bhubaneswar, PIN-751012, Odisha Email:  
[paribesh1@ospcb.org](mailto:paribesh1@ospcb.org)
5. Deputy Director of Mines, At/Po Jajpur Road, Dist-japur, Pin- 755019  
Email:[ddm.jajpurroad@orissaminerals.gov.in](mailto:ddm.jajpurroad@orissaminerals.gov.in)
6. **Member Secretary, Central Pollution Control Board**, Parivesh  
Bhawan, East Arjun Nagar, Delhi -110032 Email: [mscb.cpcb@nic.in](mailto:mscb.cpcb@nic.in)
7. **UNION OF INDIA** Through the Secretary, Ministry of Environment,  
Forests & Climate Change, Indira Paryavaran Bhawan, Jorbagh New  
Delhi – 110003,Email- [secy-moef@nic.in](mailto:secy-moef@nic.in)
8. **Director General of Mine Safety**, Government of India, Dhanbad,  
Jharkhand [dgmsindia@gmail.com](mailto:dgmsindia@gmail.com)
9. **Regional Director, Central Ground Water Board**, South Eastern  
Region, Bhubaneswar Bhujal Bhawan, Khandagiri, Bhubaneswar,

Email: [rdser-cgwb@nic.in](mailto:rdser-cgwb@nic.in)

**10. M/s Balasore alloys Ltd.**, Kaliapani Chromite Mine, represented through its Agent Mines, At/Po- Kaliapani-755047, Dist- Jajpur.

### RESPONDENTS

- I. The address of the Applicant is given above for the service of notices of this Application.
- II. The addresses of the Respondents are given above for the service of notices of this Application.
- III. The Present Application Challenges destructive activities and unscientific management of mines by the Chromite Mines leading to the obstruction of natural streams, nickel deposits in agricultural land because of the mines run off, depletion of ground water in nearby villages because of deep mining, underground water contamination with Hexavalent Chromium and the unscientific management of mines overburden causing severe environmental hazard in the locality.

### IT IS MOST RESPECTFULLY SHOWETH:

1. The Applicants is a local inhabitant belonging to Sukinda Block where the chromite ore mines are operating. The applicant and his villagers are directly affected due to the pollution caused by the Respondent Company and default of regulatory authorities in ensuring the compliance of approvals such as Environment Clearance and Consent to Operate.
2. That Orissa **accounts for about 98% of the total proved chromite (chromium ore) reserves of the country, of which about 97% occur in the Sukinda Valley**, over an area covering approximately 200 sq. km, in the Jajpur district. Presently there are **17 chromite mines operating in Sukinda**. And 16 of these 17 units, practicing opencast mining, while one is underground ( Facor, Kathpal). The **cumulative production of all the mines is around 10.8 Million Tons per Annum**.
3. That on dated 22/08/2014 the Respondent Company got environmental clearance for Underground Chromite Mine in Village Kaliapani, Tehsil, Sukinda, District Jajpur, Orissa (64.463 ha) (expansion from 0.42 MTPA to 0.6 MTPA and change in technology from opencast to opencast and

underground). Copy of the environmental clearance letter dated 22/08/2014 is annexed here unto as **ANNEXURE-1**.

4. That in the environmental clearance letter dated 22/08/2014 under the Heading of Specific Conditions in Point No. (vi) it is categorically mentioned that “Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The run off from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.” **However in the present case the private Respondent is not taking adequate steps for neutralize/ removal of hexavalent chromium prior to discharge of the same into the nearby nallah called as Damsala Nallah.**
5. It is further submitted that in the environmental clearance letter dated 22/08/2014 under the Heading of Specific Conditions in Point No. (xix) it is categorically mentioned that “Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.” **It is pertinent to mention here that the Private Respondent is not taking adequate steps for treatment of the waste water/ runoff water so as to meet the prescribed standards before reuse/discharge.**
6. It is not out of place to mention here that in the environmental clearance letter dated 22/08/2014 under the heading of General Conditions in condition No. (v) it is categorically mentioned that “There will be zero waste water discharge from the plant.” **However in the present case the Respondent Unit is directly discharging the polluted waste water/ runoff water into the Damsala Nallah and also polluting the ground water of the region.**
7. It is pertinent to mention here that on dated 15/12/2014 one corrigendum environmental clearance has been granted in favor of the Private Respondent as a typographical error occurred inadvertently in General condition No. (i) & (ii) of EC letter at page 6 in environmental clearance

letter dated 22/08/2014 for which the words in General condition 'Iron ore' & 'Iron ore and waste' rectified as 'Chrome Ore' and 'Chrome Ore and waste. Copy of the corrigendum dated 15/12/2014 is annexed here unto as **ANNEXURE-2.**

8. It is not out of place to mention here that on dated 20/01/2025 one amendment environmental clearance has been granted in favor of M/s Balasore Alloys Ltd. for Proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village Kaliapani, Tahasil- Sukinda, District Jajpur in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines (ML. area:64.463Ha) located in Village Kaliapani, Tahasil-Sukinda District Jajpur. Copy of the amendment environmental clearance letter dated 20/01/2025 is annexed here unto as **ANNEXURE-3.**
9. That in the amendment clearance letter dated 20/01/2025 under the heading of Specific condition in condition No. (ii) it is categorically mentioned that “All other conditions mentioned in the Ministry's letter No. J-11015/139/2012-IA.II(M) dated 22.08.2014 and corrigendum 15.12.2014 dated shall remain the same, as applicable.” **However in the present case the project proponent is not complying with the conditions imposed vide environmental clearance letter dated 22/08/2014 and 15/12/2014.**
10. It is pertinent to mention here that on dated 01/02/2025 one Consent to operate has been granted in favor of the private respondent for production of 0.6 MTPA Chrome Ore (ROM) and handling/processing of COB Plant of Capacity 1 x 20 TPH. That the same CTO is valid for the period upto 31/03/2026. Copy of the CTO dated 01/02/2025 is annexed here unto as **ANNEXURE-4.**
11. That in the CTO letter dated **01/02/2025** it is categorically mentioned that *“4) The mine authority shall submit a time-bound action plan within 15 daytime to complete the following jobs for improvement of environmental status of the mine.*

*i) Repair of damaged portion of the internal road adjacent to the OB dump-1*

*ii) Replacement of the sensors at EQMS with new EQMS sensor at the inlet and outlet of ETP to resume transfer of monitoring data to SPCB Server. Till such time record keeping shall be done of physical monitoring of water at ETP inlet and outlet and quantity of chemical consumed in ETP*

*iii) Upgradation of existing STP with 40m<sup>3</sup>/day*

*iv) Deployment of a mist canon for strengthening of air pollution control measures at the ore stockyard and repair of existing fixed water sprinkling system alongside side road*

*v) Installation of dry fog system at the feeding hopper of COB plant by replacing the existing manual water sprinkling facility.”*

It is pertinent to mention here that though in the CTO it is specifically mentioned that the **mine authority shall submit a time-bound action plan within 15 days time to complete the aforementioned jobs however as on date above mentioned jobs are not complied by the mine authorities.**

12. It is not out of place to mention here that the State Pollution Control Board on dated 24<sup>th</sup> November 2025 conducted a river water quality monitoring, and during inspection it is found that the water quality of the Damsala Nallah is found to be higher than the Board's prescribed standards in various locations.
13. That pursuant to the analysis of the water samples collected from various sources, **SPCB on dated 09/12/2025 issued one direction to the Respondent Unit stating “Therefore, to maintain the water quality of Damsala Nallah: you are directed to take adequate treatment of your mine drainage discharge / Surface runoff through ETP before discharging to Damsala Nallah, Action taken report shall be submitted to this office within 7 days from the date of issue of this letter with a copy to Head office.”** Though the 7 days time period has already lapsed as on date no adequate measures has been taken by the Respondent Unit so as to treat the surface runoff water prior to discharge into the Damsala Nallah. Copy

of the direction dated 09/12/2025 issued by SPCB is annexed here unto as **ANNEXURE-5**.

14. It is most humbly submitted that from the photographs it is also evident that the Respondent Unit is discharging untreated waste water/ surface runoff water directly into the Damsala Nallah and thereby polluting the Damsala Nallah and the ground water. Copy of the photographs suggesting direct discharge of the untreated waste water/ surface runoff water into the Damsala Nallah is annexed here unto as **ANNEXURE-6**.
15. It is pertinent to mention here that in the month of June 2025, the Ministry of Jal Shakti conducted an inspection of Ground Water Quality in Sukinda Valley, Jajpur District, Odisha and **higher concentration of chromium was found in ground water**. The Sukinda Valley area has **phreatic aquifer up to a depth of 30 meter below ground level followed by fractured deeper aquifer**. A total number of **233 samples were collected** from the study area and analysed. The samples were collected from hand pumps, dug wells, Effluent Treatment Plant (ETP) mine pits, Damsala Nala and Brahmani River. In addition to these groundwater samples, samples were also collected from surface water body (pond, spring and river), to assess the quality. **Out of 233 samples, 37 samples have shown higher concentration of chromium (VI) above 0.05 mg/l during pre-monsoon and 28 locations have shown chromium (VI) above 0.05 mg/l during post-monsoon season**. Copy of the inspection report of June 2025 is annexed here unto as **ANNEXURE-7**.
16. That in the inspection report of June 2025 in conclusion and recommendation under point No. 7 it is specifically recommended that “Effluent treatment systems in the mining areas must be strictly maintained to ensure effective treatment and compliance with discharge standards. This is crucial to prevent contamination of nearby surface water bodies”. However, in the present case the recommendation made by the Ministry is not followed by the project proponent and on the contrary the project proponent is directly discharging the contaminated waste water into the perennial nallahs and also to the agricultural lands.
17. In September 2007, the Blacksmith Institute had listed **Sukinda as one of the 10 most polluted places in the world**. The valley is abundant in the deposits of chromite and has the **largest open cast chromite ore mines in**

**the world.** The mines operate in the area without proper environmental controls, and pollution caused by the mines is a major health hazard. 60% of the drinking water contains hexavalent chromium at levels more than double the international standards and as per an Indian health group estimations 84.75% of deaths in the mining areas, where regulations are non-existent are due to chromite-related diseases. There has been virtually no attempt to clean up the contamination

18. Presence of Cr (VI) in mine drainage water as the **Opencast chromite mining generates huge volumes of seepage water.** Even though chromium in chromite is in the trivalent state, some hexavalent Cr(VI) is always formed due to certain complex reactions. If Cr(VI) containing mine drainage water is released untreated, can severely contaminate the nearby water bodies. Many mines have chrome ore beneficiation (COB) plants, where chromium content in the ore is concentrated through washing and sorting. Washings from the COB plants can also be a source of Cr(VI).
19. **Water Quality Status in Sukinda Valley Area:** Damsala nallah, a small rivulet flows through the valley and meets the Brahmani River. There are seventeen chromite mines in valley which discharge their effluent into Damsala Nallah. The water from these mines naturally contains hexavalent chromium as a pollutant. In order to control Hexavalent Chromium concentration in Damsala Nallah, the State Pollution Control Board had conducted a study in the year 2012, through IIT, **Kharagpur to make an assessment of the then prevailing treatment system. The study by IIT, Kharagpur found that the treatment plants were inadequate to treat hexavalent chromium to maintain the water quality of Damsala Nallah below the tolerance limit of 0.05 mg/l.** Accordingly, it was suggested to upgrade the treatment plants of all the mines.
20. **Overburden generation:** Opencast chromite mining generates enormous quantities of overburden (OB). The stripping ratio varies from 1:5 to 1:10 and in some cases overburden ratio having the maximum output of **14.55 Metric Tons of waste generated against 1.0 Metric Tons of Ore.** Unless managed properly, run offs from the OB dumps have the dual potential of polluting the water bodies by siltation and leaching of Cr(VI).  
**Dust generation:** Huge amounts of dust are released during mining, stacking and loading. The dust is, though mostly, chromite particles, may also contain

traces of Cr(VI). Unfortunately, chromite bearing mines occur mostly in forest areas, thus an inevitable loss of huge forest cover due to mining.

21. **The Damsala rivulet** crosses the mining belt along the length. This being the main source of water (at least during the earlier days), settlements and villages have developed around this rivulet. Damsala, carries the mine drainage water from almost all the mines. Water samples collected from various points of the river, starting from the site with no mining activity to the downstream of all the mines, show marginal increase in Cr(VI) concentration, but is still within the stipulated standards for drinking and bathing water. It should, however, be borne in mind that the water quality of Damsala river with respect to Cr(VI) is governed by the quality of discharge of the treated mine drainage water
22. That because of the obstruction of nallah, the streams got dried and facing a silent death. The streams used to irrigate 500 acres of agricultural land and because of the streams dried, now most of the land could not be irrigated.
23. That because of the large number of vehicles transporting the minerals, the roads become more polluted with dusts and the local commuters are suffering as sprinkling on roads are not being done regularly. That even though no improvement in the situation has taken place on ground, but the pollution control board remain a mute spectator and allowing the unit to operate in violation of the environment norms.
24. That because of the discharge of untreated water by the Respondent Company to the Damsala Nallah, the water has been contaminated and people bathing in the Damsala nalla water are complaining of the skin diseases.
25. That the Open cast chromite mining generates huge volumes of seepage water. This water seeps into the ground of the quarry. It dissolves the chromium. The chromium in C trivalent stage Cr (III) turns into the hexavalent Cr(VI) form due to complex reactions (including oxidation). Hexavalent chromium is more soluble in water than any other form. It is also the most toxic form of chromium. Studies have shown that Cr (III) in minerals can get oxidised to Cr(VI) and its problems are exacerbated. It is submitted that the threat of hexavalent chromium in the region is quite imminent and an independent study can dig out more information on the impact of hexavalent chromium in the locality.

26. It is further submitted that the local people are also complaining of Kidney related disease and persistent cold in bodies and the reasons are attributed to the polluted water in the locality.
27. That because of deep mining the water level in the locality have depleted and no when local people make hue and cry the Respondent Company makes available water in tankers at its whims. It is humbly submitted that there is need for necessary corrective measures so as to address the water depletion issue which is also a condition in environment clearance letter and no such long-term corrective measures like supply of treated water from any of the nearby river needs to be done and has not been done even after mining of more than thirty years.

### **Grounds**

- a) Unscientific Dumping of Over Burden in Private Agriculture and Community Forest Land is causing serious damage to land.
- b) Discharge of Untreated Mine Water directly to the Damsala Nallah and there by polluting the water bodies,
- c) Blockage/Obstruction of 1<sup>st</sup> and 2<sup>nd</sup> order natural streams by overburden of the respondent company.
- d) The mines run off water discharged to the natural streams during rainy season making the entire water source unfit for use.
- e) That the Ongoing Mining Operation by the Respondent Company is in gross violation of the conditions of Environment Clearance, Consent to Operate and Principles of Sustainable Development, Precautionary Principle and Polluters Pay Principle.

### **LIMITATION**

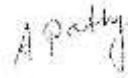
That there is a subsisting cause of action because of the Direction issued by SPCB in December 2025 and the Respondent Unit as on date not fully compliant to the directions, hence the application is not barred by limitation.

**PRAYER**

- A. That the Environment Clearance granted in favor of Respondent No.10 may be suspended till full compliance of all the conditions imposed in Environment Clearance letter.
- B. Direct the Opposite Parties to remove the overburden material and allow free flow of natural streams and Restrain the Mines from discharging the mine water/run off water to the natural streams and nallas.
- C. Direct the respondent No.10 to restore the damage caused to the agricultural land and water bodies due to overburden and other mining related activities of the Company Respondent.
- D. Constitute an independent fact finding committee to assess the damages caused to the agricultural lands and streams/nallas because of the obstruction, discharge of mine water and due to action of the Respondent No.10.

The Hon'ble Tribunal may pass any other order deems fit in the interest of justice

Applicant Through



ADVOCATE

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BENCH, KOLKATA

ORIGINAL APPLICATION NO. - of 2026/EZ

IN THE MATTER OF:

KAILASH CHANDRA NAYAK

APPLICANT

VERSUS

STATE OF ODISHA AND Others ...

RESPONDENTS

04 APR 2026

AFFIDAVIT

I, Kailash Chandra Nayak, C/o- Chakradhar Nayak, aged about- 48 years, At/Po- Nuadihi, Dist- Jajpur, Pin- 755018, Odisha do hereby solemnly affirm, and declare as under.

1. That I am the Applicant in the above mentioned Application and fully conversant with the facts and circumstances of the case and therefore competent to swear this affidavit
2. That I have read over the contents of the accompanying Affidavit and the same is true and correct and is drafted on my instruction.

*Kailash chandra Nayak*

DEPONENT

VERIFICATION

Verified on this 04 day 2026.....2026 at BBSR that the contents of the above affidavit are true and correct. No part of it is false and nothing material has been concealed there from.

Identified By

*Advocate 0-10/8/23*  
Advocate

*Kailash chandra Nayak*  
DEPONENT



I, the above named deponent(s) being identified by Sri. *S.P. Ray* Advocate, Bhubaneswar, who has been before me on day 04 APR 2026 at BBSR on oath the contents of this affidavit are true to the best of his / her / their knowledge and belief.  
**JANMEJAYA RAUTRAY**  
**NOTARY, GOVT. OF ODISHA**  
**BHUWANESWAR**  
**REGD. NO. ON-86/2012**  
**MOB No-79\*8581217**

**BY SPEED POST**

**No. J-11015/139/2012-IA.II (M)**  
**Government of India**  
**Ministry of Environment, Forests & Climate Change**  
**Impact Assessment Division**

3rd Floor, Vayu Wing,  
 Indira Paryavaran Bhawan,  
 Jorbagh Road, Aliganj,  
 New Delhi-110 003

**Dated: 22<sup>nd</sup> August, 2014**

To,

**M/s Balsore alloys Limited**  
 Kaliapani Chromite Mine  
 At/P.O. Kaliapani-755047

**Subject: Underground Chromite Mine of M/s Balasore Alloys Ltd., Village Kaliapani, Tehsil Sukinda, District Jajpur, Orissa (64.463 ha) (expansion from 0.42 MTPA to 0.6 MTPA and change in technology from opencast to opencast and underground)- Environmental clearance regarding.**

Sir,

This has reference to your letter No. Nil dated 04.05.2012 on the subject mentioned above and subsequent letters dated 01.10.2013 and 15.10.2013. The terms of reference to the proposal for undertaking detailed EIA study were prescribed on 11.10.2012. The proponent submitted the EIA/EMP and public hearing documents which was considered by Expert Appraisal Committee in its meeting held during 31<sup>st</sup> October & 1<sup>st</sup> November, 2013 and re-considered during March 20-21, 2014. The Committee recommended the proposal for grant of environmental clearance.

2. The proposal is for existing Kaliapani Chromite Mine (ML Area - 64.463 Ha.) at Village Kaliapani, Tehsil : Sukinda, District : Jajpur (Odisha). The Latitude & Longitude of the site is 21°00'07"-21°02'46"N and 85°44'12" - 85°47'22" E. The compliance report of the EC conditions stipulated by MoEF, New Delhi vide letter no. J -11015/341/2006-IA.II (M) dated 3<sup>rd</sup> July, 2007 were discussed. It was noted that the conditions stipulated in earlier EC were by and large complied and no specific condition is required in this regard.

3. The total mine lease area is 64.463 ha is Government Land. Modified Mining Scheme is approved by IBM vide letter no. 314(3)/2012-MCCM (CZ)/MS -11 dated 17.12.2012 under rule 10 of MCDR 1988. This is a proposal for expansion in production capacity from 0.42 MTPA & 0.6 MTPA and Change in Technology from Opencast to Opencast & Underground including mining of blocked pillars in open pit mines by Drift & Fill mining method. The Opencast process will be done by mechanized method involving drilling & blasting, loading and transportation of the excavated material. Wet drilling is performed by 100 mm dia DTH drills associated with compatible size compressors. Non cap sensitive slurry of 83mm dia cartridge like Aqua

dyne, as column charge and for secondary blasting Aqua dyne - 25 explosive cartridge of 25 mm dia will be adopted.

4. The total mineable reserves are 26.89 Million Tonnes. The anticipated life of mine is approximately 45 years. It was reported by the PP that the total waste generation at the end of the life of the mine will be 4.08 million cum. At the conceptual stage, about 32.34 ha area will be covered under waste dump. The same will be stabilized by plantation.

5. Total fresh water requirement for the project is 347.2 KLD, out of which 220 KLD is required for beneficiation Plant, 115 KLD for mining operations & Green belt and 12.2 KLD for Domestic/drinking purpose. The requirement is being met from mine discharge water & borewell. Necessary Clearance from CGWA, Ministry of Water Resource, Govt Of India for withdrawal of 53 KLD of water from bore well and 294.2 KLD of Mine Dewater with a total amount not exceeding 347.2 KLD has been obtained vide letter No. 21-4(44)/SER/CGWA/2008-1845 Dated 11.10.2013. It was reported by the PP that during Underground mining, ground water table shall be intersected. NOC for the same shall be obtained from CGWA.

6. It was reported by PP that there is no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant Reserves (existing or proposed) etc. within the study area (10 km radius of the mining lease boundary). There are two protected Forests and three Reserved Forests exist within 10 km radius of the mining lease boundary. Authenticated list of flora and fauna was submitted. The nine Schedule-I species are reported from the study area. Species Specific Conservation plan for the schedule-I species i.e. Leopard, *Panthera pardus*; Elephant, *Elephas maximus*; Sloth bear, *Melursus ursinus*; Ratel, *Mellivora capensis*; Indian pangolin, *Manis crassicaudata*; Peafowl, *Pavo cristatus*; Indian rock python, *Python molurus*; Monitor lizards, Bengal & Yellow monitor was submitted. The plan has been forwarded by Divisional Forest Officer, Cuttack forest division.

7. Baseline data for Site-specific Micro-meteorological data, ambient air quality (PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>2</sub>), water quality, noise level, soil and flora and fauna was collected during Post Monsoon Season 2012 (Oct to Dec-2012). Results are found within permissible limits. The Public Hearing for the Project was conducted at Kaliapani Village on 04.04.2013. The Public Hearing was chaired by Mr. Chakrayudha Hota, Additional District Magistrate as per EIA Notification, 2006. Major issues raised during public hearing were related to treatment of Mine Drainage Water, Air pollution and control measures, ground water depletion in mining lease area, provision of check dams for irrigation of agricultural land, deforestation and peripheral development (education, health service, drinking water supply and Employment). Total cost of the project is Rs. 599.0 Crores. Capital cost for Environment Protection Measures has been earmarked Rs. 82.5 Crores along with annual recurring cost Rs. 75.7 Lakh/year.

8. The Ministry of Environment and Forests has examined the application in accordance with the EIA Notification, 2006 and hereby accords environmental clearance under the provisions thereof to the above mentioned proposal of Underground Chromite Mine of M/s Balasore Alloys Ltd. for enhancement of production from 0.42 MTPA to 0.6 MTPA (ROM) and change in technology from opencast to opencast and underground in the mine lease area of 64.463 ha located at Village Kaliapani, Tehsil Sukinda, District Jajpur, Orissa subject to implementation of the following conditions and environmental safeguards.

#### A. Specific Conditions

- (i) Mining shall not commence without necessary permissions for drawl of water and intersection of ground water table.
- (ii) Mitigation measures such as well-designed ventilation network within underground mine, provision of Personal Protective Equipment should be ensured and necessary training and awareness programs for mine workers should be undertaken.
- (iii) Continuous monitoring of Mine water should be done and reports furnished.
- (iv) Continuous monitoring of all drinking water sources for Cr(VI) of Mine water should be done and reports furnished.
- (v) Morbidity pattern which is a sensitive indicator of ill health with regard to Cr related diseases need to be done.
- (vi) Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The run off from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.
- (vii) The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.
- (viii) Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with compliance report.
- (ix) As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analysed for their mineralogical composition and records maintained.
- (x) Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
- (xi) Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality

- parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
- (xii) The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.
  - (xiii) Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezo meters during the mining operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.
  - (xiv) The project proponent shall regularly monitor the flow rate of the natural water streams flowing adjacent to the mine lease and maintain the records.
  - (xv) The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.
  - (xvi) Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data.
  - (xvii) Plantation shall be raised in an area of 36.156 Ha. including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of excavated void to be converted in to water body, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per Ha.
  - (xviii) Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
  - (xix) Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.

## B. General Conditions

- (i) No change in Iron Ore Processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.
- (ii) No change in the calendar plan including Processing/Beneficiation of mineral iron ore and waste should be made.
- (iii) At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e., PM<sub>10</sub>) and NO<sub>x</sub> monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry, including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.
- (iv) Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.
- (v) There will be zero waste water discharge from the plant.
- (vi) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.
- (vii) Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
- (viii) A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.
- (ix) The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.
- (x) The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.
- (xi) The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.
- (xii) The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions

- (xx) The decanted water from the beneficiation plant and slime/tailing pond shall be re-circulated within the mine and there shall be zero discharge from the mine.
- (xxi) Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.
- (xxii) Regular monitoring of water quality, upstream and downstream of natural water bodies shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.
- (xxiii) Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.
- (xxiv) Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.
- (xxv) Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.
- (xxvi) Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.
- (xxvii) Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.
- (xxviii) The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife Conservation Plan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.
- (xxix) A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.
- (xxx) The project proponent shall undertake all the commitments made during the public hearing and effectively address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.

including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.

- (xiii) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.
- (xiv) The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.
- (xv) The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.
- (xvi) The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at <http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.

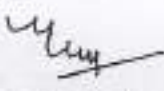
9. The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

10. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

11. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention &

Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/ High Court of Odhisa and any other Court of Law relating to the subject matter.

12. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

  
(Dr. V.P. Upadhyay)  
Director

**Copy to:**

- (i) The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
- (ii) The Secretary, Department of Environment, Government of Odhisa, Secretariat, Bhubaneswar.
- (iii) The Secretary, Department of Mines and Geology, Government of Odhisha, Secretariat, Bhubaneswar.
- (iv) The Secretary, Department of Forests, Government of Odhisha, Secretariat, Bhubaneswar.
- (v) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
- (vi) The Additional Principal Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests, A-3 Chandrashekharapur, Bhubaneswar-751023.
- (vii) The Chairman, Odhisa State Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012.
- (viii) The Controller General, Indian Bureau of Mines, Indira Bhawan, Civil Lines, Nagpur-440 001.
- (ix) The Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
- (x) The District Collector, Jajpur District, Government of Odhisa.
- (xi) Record File.
- (xii) MoEF Website

(Dr. V.P. Upadhyay)  
Director

**BY SPEED POST**

**No. J-11015/139/2012-IA.II (M)**  
**Government of India**  
**Ministry of Environment, Forests & Climate Change**  
**Impact Assessment Division**

3<sup>rd</sup> Floor, Vayu Wing,  
 Indira Paryavaran Bhawan,  
 Jorbagh Road, Aliganj,  
 New Delhi-110 003  
 Tele: 011-24695304

E-mail: vp.upadhyay@nic.in

**Dated: 15<sup>th</sup> December, 2014**

To  
 M/s Balsore Alloys Limited,  
 Kaliapani Chromite Mine,  
 At/ P.O. Kaliapani-755047

Fax:06726-268520

E-mail: sukinda\_mines@balasorealloys.com

**CORRIGENDUM**

**Subject: Underground Chromite Mine of M/s Balasore Alloys Ltd., Village Kaliapani, Tehsil Sukinda, District Jajpur, Orissa (64.463 ha) (expansion from 0.42 MTPA to 0.6 MTPA and change in technology from opencast to opencast and underground)- Environmental clearance regarding.**

Sir,

This is in continuation of MoEF letter even no. dated 22<sup>nd</sup> August, 2014 granting Environmental Clearance to above mentioned project.

2. A typographical error occurred inadvertently in General condition No. (i) & (ii) of EC letter at page 6. The words in General condition 'Iron ore' & 'Iron ore and waste' need to be rectified as 'Chrome Ore' and 'Chrome Ore and waste'.

3. Hence, the General condition No. (i) & (ii) of EC letter at page 6 are now substituted as follows:

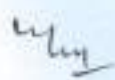
**B General Condition**

(i) No change in Chrome ore Processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment, Forests and Climate Change.

(ii) No change in the calendar plan including Processing/Beneficiation of mineral Chrome ore and waste should be made.

4. All other terms and conditions mentioned in this Ministry's letter of even no. dated 22.08.2014 shall remain the same.

5. This issues with the approval of the Competent Authority.

  
**(Dr. V.P. Upadhyay)**  
**Scientist 'F'**

**Copy to:**

- (i) The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
- (ii) The Secretary, Department of Environment, Government of Odhisa, Secretariat, Bhubaneswar.
- (iii) The Secretary, Department of Mines and Geology, Government of Odhisha, Secretariat, Bhubaneswar.
- (iv) The Secretary, Department of Forests, Government of Odhisha, Secretariat, Bhubaneswar.
- (v) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
- (vi) The Additional Principal Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests, A-3 Chandrashekharapur, Bhubaneshwar-751023.
- (vii) The Chairman, Odhisa State Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneshwar-751012.
- (viii) The Controller General, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-440 001.
- (ix) The Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
- (x) The District Collector, Jajpur District, Government of Odhisa.
- (xi) Record File.
- (xii) MoEF Website

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**(Dr. V.P. Upadhyay)**  
**Scientist 'F'**



**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, ODISHA**  
 5RF-2/1, Unit-IX, Bhubaneswar-751022, Tel: 0674-3510075, Email: seiaaorissa@gmail.com  
 statutory body constituted by Ministry of Environment, Forest & Climate Change under Environment  
 (Protection) Act, 1986

**SEIAA File No. SIA/OR/MIN/305365/2023**

Letter No. 6246/SEIAA

Dated 20.01.2025.

To

Sri. A Nagendra Kumar, Managing Director  
 M/s. Balasore Alloys Ltd.;  
 Village- Kaliapani, Tahasil-Sukinda District- Jajpur

**Subject: Application of M/s Balasore Alloys Ltd. for Proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village- Kaliapani, Tahasil- Sukinda, District Jajpur in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines(ML area:64.463Ha) located in Village- Kaliapani, Tahasil-Sukinda District- Jajpur -Amendment of Environmental Clearance reg.**

Sir,

This has reference to your online proposal No. SIA/OR/MIN/305365/2023 dated 06.10.2023, submitted to SEIAA, Odisha for Amendment of Environmental Clearance(EC) for Proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village- Kaliapani, Tahasil- Sukinda, District Jajpur in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines(ML area:64.463Ha) located in Village- Kaliapani, Tahasil-Sukinda District- Jajpur by M/s Balasore Alloys Ltd filed by Sri. A Nagendra Kumar, Managing Director in terms of the provisions of the Environment Impact Assessment(EIA) Notification, 2006 under the Environment(Protection) Act,1986 and subsequent amendments thereto.

**2. Proposal in Brief:**

|   |  |
|---|--|
| Proposal No.                            | SIA/OR/MIN/305365/2023   |
| Date of application                     | 06.10.2023   |
| State file no.                          | J-11015/139/2012-IA.II(M)  |
| Project Type                            | Amendment of EC  |
| Category                                | B1   |
| Project/Activity including Schedule No. | 1(a)- Mining of Minerals   |
| Name of the Project                     | Proposal for Amendment Environmental Clearance of M/s Balasore Alloys Ltd, |


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|                                  |  |
|----------------------------------|--|
|                                  | Kaliapani Chromite Mines for "Proposal of Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd. in Village Kaliapani, Tehsil Sukinda, District Jajpur, Odisha, in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA producing 0.6 MTPA of Chrome ore from Kaliapani Chromite Mines(ML area 64.463 ha) located at Village- Kaliapani, Tahasil-Sukinda District-Jajpur |
| Name of the company/Organization | Applicant:-M/s. Balasore Alloys Ltd.; Sri. A Nagendra Kumar, Managing Director   |
| Location of Project              | Village- Kaliapani, Tahasil-Sukinda District-Jajpur  |

3. **Project Details:** The highlights of the proposal as ascertained from the application as submitted by PP and as revealed from proceedings/discussion held during the meeting of SEAC/SEIAA, are given as under.

- (i) This is a proposal of M/s Balasore Alloys Ltd, for Amendment of Environmental Clearance Kaliapani Chromite Mines for proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village- Kaliapani, Tahasil-Sukinda, District-Jajpur, in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines (ML area 64.463 ha) located in Village-Kaliapani, Tahasil-Sukinda, District- Jajpur filed by Sri. A Nagendra Kumar, Managing Director.
- (ii) The Govt. of Odisha has issued Terms & Conditions that would govern the grant of mining lease of 100.063 Ha vide their letter no VI-SM-108/99-3927/SM dated 24/5/1999. Further Govt. of Odisha has split up the total area of 100.063 Ha into two leases viz 64.463 Ha (Non-Forest area), 35.6 Ha (forest area) vide letter No 1864/SM BBSR Dt 16/02/2000. The Mining Lease Deed of 64.463 Ha was executed vide Lease Deed dated 17.07.2000. Lease



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Deed was further modified on 01.01.2008 for change of name from Ispat Alloys Ltd. to Balasore Alloys Ltd.

- (iii) Earlier EC & ToR Details:- ToR was issued by MoEF & CC Vide No . J-11015/139/2012-IA-II (M) dated 11th October, 2012 for an annual production capacity of 0.6 MTPA of Chrome ore by opencast and underground including mining of blocked pillars in open pit mines by drift and fill mechanized mining method. Environmental Clearance for the project has been received from Ministry of Environment, Forests & Climate Change (MoEF&CC), Govt. of India, New Delhi with an annual production capacity of 0.6 MTPA of Chrome ore by opencast and underground including mining of blocked pillars in open pit mines by drift and fill mechanized mining method vide Letter No J-11015/139/2012-IA.II (M) Dated 22nd August 2014.
- (iv) Public hearing details: As per the EIA Notification dated 14th September, 2006, Public hearing for this project was conducted on 4th April, 2013 at 11:00 AM in the Open place over Khata no. 55, Plot no. 888 of Kaliapani village in front of main gate of M/s Blasore Alloys Ltd. in accordance with the procedure to obtain the Environmental Clearance.
- (v) List of Statutory clearances obtained earlier:
- Environmental Clearance for the project has been received from Ministry of Environment, Forests & Climate Change (MoEF&CC), Govt. of India, New Delhi with an annual production capacity of 0.6MTPA of Chrome ore by open cast and underground including mining of blocked pillars in open pit mines by drift and fill mechanized mining method vide Letter No J-11015/139/2012-IA.II (M) Dated 22<sup>nd</sup> August 2014 .
  - Consent to Establish(CTE) has been obtained for production 0.06 MTPA chrome ore with open cast and underground including mining of blocked pillars in open pit mines by drift and fill mechanized mining method vide No 16196/IND-II-NOC-5723 date 08/10/2017
  - Consent to Operate (CTO) was obtained for production of 0.6 MTPA Chrome Ore form State Pollution Control Board, Odisha vide No 3749/IND-I-CON-2576 date 28.03.2018 valid upto 31.3.2023.
  - Mine operation is under suspension since 22.6.2022
  - Scheme of mining has been modified and approved by Indian Bureau of Mines, Govt. of India vide letter No BBS/JJR/CR/2169/2022-23 dated 03.06.2022 .
  - Stage –I Forest Clearance was accorded by MOEF & CC for this mining project vide No F.No.8-14/2016-FC dated 18<sup>th</sup> November,2016 and approval of Stage-II order is under consideration with MoEF&CC.



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- (vi) Forest Clearance Status: The ML area is of 64.463 ha is of Non- Forest Land Kism as per lease deed. However, in view of MoEF guidelines, vide No. 8-78/1996-FC (pt) dated 10.3.2015 and subsequent Circular dated 30.3.2015 issued by State Govt. certified Land Schedule vide letter No. 2899, dated 30.10.2015 out of 64.463 ha ML area, 64.119 ha was classified as Sal Jungle i.e., Forest Kism as on 25.10.1980 and balance 0.344 ha as road(Non-Forest). Stage-I Forest Clearance was accorded by MOEF & CC for this mining project vide No F.No.8-14/2016-FC dated 18th November,2016 and approval of Stage-II order is under consideration with MoEF&CC.
- (vii) Scheme of mining has been modified and approved by Indian Bureau of Mines, Govt. of India vide letter No BBS/JJR/CR/2169/2022-23 dated 03.06.2022.
- (viii) Project details: the proponent has applied for amendment of existing environmental clearance vide no Vide No J-11015/139/2012-IA.II (M) Dtd.22.8.2014 for production of 0.6 MTPA for the proposal of common boundary dumping and mining with Jindal Chromite Mines of M/s Jindal Stainless Ltd in addition to existing opencast, underground, Boundary pillar Mining and Common Boundary Mining and Dumping with M/s IMFA.
- (ix) Location and connectivity: The proposed project site is located in Village - Kaliapani, Tahasil-Sukinda, District-Jajpur bearing topo sheet no 73 G/12, G/16, H/9, H/13 bounded by Latitude:21°02'9.82''N to 21°01'33.05''N and Longitude: 85°45'29.24''E to 85°46'28.24''E.Nearest SH-20 (25 km in ESE direction); NH-200 (23 km in South direction); NH-215 (38 km in East direction); and NH-5 (62 km in SE direction). Nearest railway station is Jajpur-Keonjhar Road (52 km, SE). Nearest airport is Bhubaneswar Airport (150 Km, South). There are totally 13 operating chromite mines in Sukinda valley. In addition to the existing BAL mine, Eleven opencast mines and Two underground mine (FACOR-Kathapal & Mahagiri,IMFA) in Sukinda valley. Some of the mines has been operating since 1960/1980.
- (x) Method of Mining: Opencast and underground mining method along with boundary pillar Mining, common Boundary mining with M/s IMFA an M/S JSL shall be carried out by engaging Tripper, Dumper, Loader, Excavator, Road Header, Belt Conveyor etc. as per approved Mining Plan . Transportation shall be carried through road.



(xi) (Dump) management:

| SL. No. | Dump ID  | Dump status | Type of Dump | Total Dump Quantity (MT) | Area covered by Dump (Ha) | Height (M) |
|---------|----------|-------------|--------------|--------------------------|---------------------------|------------|
| 1       | Dump -1  | Active      | OB           | 4418374                  | 13.500                    | 79         |
| 2       | Dump-2   | Active      | OB           | 1045259                  | 5.945                     | 37         |
| 3       | Dump - 3 | Active      | OB           | 5429463                  | 14.880                    | 65         |
| Total   |          |             |              | 10893096                 | 34.325                    |            |

(xii) Waste Generation And Management:

| Sl. No | Waste details                               | Management   |
|--------|---|--|
| 1      | Overburden                                  | Dumped at earmarked Place with arrangement of Garland drain, Toe wall, plantation and coir matting               |
| 2      | COBP tailing                                | Collected through Dumper and Stacked at earmark place with adequate measure                                      |
| 3      | ETP Sludge                                  | Disposed to Common TSDF at Sukinda   |
| 4      | Used Oil                                    | Disposed to SPCB Authorized vendor   |
| 5      | Oil Contaminated Waste                      | Disposed to SPCB Authorized vendor   |
| 6      | Waste Water from mine /domestic waste water | Treated in existing ETP and STP respectively. Treated effluent is partly used and rest is discharged to outside. |

- (xiii) Water requirement: Water requirement of mines will be 360 KLD, which will be sourced from one bore well and mine dewater.
- (xiv) ETP/STP Details: Effluent treatment Plant of 750 KLH capacity has been installed for treatment of Mine water and STP of 50 KLD capacity installed for Treatment of Domestic waste water.
- (xv) Power Requirement: Power requirement for the proposed project is 1300 KVA (1040 KW) LT 415 V AC and the unit has 6.0 KW solar system in mines.
- (xvi) Greenbelt: 80540 nos. of saplings planted at dump slope, roadside inside ML area since 2010-11. Green belt has been developed over 0.17 ha of safety zone area.



**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, ODISHA**

5RF-2/1, Unit-IX, Bhubaneswar-751022, Tel: 0674-3510075, Email: seiaaorissa@gmail.com

*statutory body constituted by Ministry of Environment, Forest & Climate Change under Environment (Protection) Act, 1986*

- (xvii) Rain Water Harvesting Details: Two nos. of Roof Top rain water harvesting structure has been planned and one is being completed and another structure is ongoing. It is calculated to recharge at least 5,000 m<sup>3</sup>/year of water to be recharged to the underlain fractured aquifer through rooftop rainwater harvesting structure. Thus, the total quantum of annual recharge is expected to be around 46,000 m<sup>3</sup>/annum.
- (xviii) Project cost: Estimated cost of the proposed project is 529 Crore. EMP Capital cost is 500.26 Lakh and Recurring Cost is 580.00 Lakh. CSR Cost is Rs 80 Lakh/Annum as proposed.
- (xix) The Project Proponent made a presentation on the proposal before the Committee on 20.10.2023.
- (xx) The SEAC observed that this is a proposal for Amendment of Environmental Clearance of M/s Balasore Alloys Ltd, Kaliapani Chromite Mines for "Proposal of Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Limited in Village Kaliapani, Tehsil Sukinda, District Jajpur, Odisha, in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA producing 0.6 MTPA of Chrome ore by Kaliapani Chromite Mines (ML area 64.463 ha) at Kaliapani Dist Jajpur of Sri A Nagendra Kumar. The SEAC opined that this is a policy matter need to be discussed jointly with M/s Jindal Stainless Ltd., M/s Tata Steel Mining Limited, M/s Balasore Alloy Limited, Steel and Mines Department, Govt. of Odisha and concerned official in Forest Department, Govt. of Odisha before going to take decision for amendment of EC.
- (xxi) The proponent has furnished ADS to SEAC on 22.11.2023.
4. The SEAC have appraised the proposal for amendment of EC in its meeting held on dated 19.10.2024 and have recommended to return the proposal to SEIAA, Odisha with a request that SEIAA, Odisha may consider to discuss jointly with M/s Jindal Stainless Ltd., M/s Tata Steel Mining Limited, M/s Balasore Alloy Limited, Steel and Mines Department, Govt. of Odisha and concerned official in Forest Department, Govt. of Odisha for taking decision for amendment of EC.
  5. This proposal conforms to the item no. 1(a)-'Mining of Minerals in the schedule of EIA Notification, 2006 as amended time to time, and the major mineral extraction project falls under Category B1 as the mining lease area is  $\leq$  250Ha.
  6. The matter was again examined in the State Environment Impact Assessment Authority (SEIAA), Odisha in its 183<sup>rd</sup> meeting held on 23.12.2024, recommendation of SEAC and in accordance with the EIA Notification, 2006 and



further amendments thereto. After detailed deliberation, the authority approved the Amendment of EC based on the Renewal of permission granted vide this Directorate's Ir No.BJA/CH-2&12/111(3)/2015/1697-98 dated 08.07.2015, under Reg.111(3) of the Metalliferous Mines Regulations, 1961 for dumping of overburden within 7.5m of the common boundary between Kaliapani Chromite mine of M/s Balasore Alloys Ltd. And Jindal Chromite Mine of M/s Jindal Stainless Ltd.vide letter No. BJA/CH-2&12/P-111(3)/2017 / 2034 / Bhubaneswar dated 14.08.2017 on Permission for dumping of overburden.

7. **Amendment of Environmental Clearance (EC) is granted under the provisions of EIA Notification No. S.O. 1533 (E) dated the 14<sup>th</sup> September, 2006 of the Government of India in the erstwhile Ministry of Environment and Forests, as amended from time to time for Proposed Common Boundary Mining and Common Boundary Dumping with Jindal Chromite Mines of M/s Jindal Stainless Ltd., located in Village- Kaliapani, Tahasil- Sukinda, District Jajpur in addition to the existing activities viz. Opencast & Underground mining, mining of blocked pillar in open pit mines & Common Boundary Dumping with M/s IMFA, with production capacity of Chrome Ore 0.6 MTPA from Kaliapani Chromite Mines(ML area:64.463Ha) located in Village- Kaliapani, Tahasil-Sukinda District- Jajpur by M/s Balasore Alloys Ltd.” with the following additional stipulations, environmental conditions and safeguards.**

**Stipulations:**

**A. Specific conditions:**

- (i) This Amendment of EC is granted based on the renewal of permission granted vide this Directorate's Ir No.BJA/CH-2&12/111(3)/2015/1697-98 dated 08.07.2015, under Reg.111(3) of the Metalliferous Mines Regulations, 1961 for dumping of overburden within 7.5m of the common boundary between Kaliapani Chromite mine of M/s Balasore Alloys Ltd. And Jindal Chromite Mine of M/s Jindal Stainless Ltd. vide letter No. BJA/CH-2&12/P-111(3)/2017 / 2034 / Bhubaneswar dated 14.08.2017 on Permission for dumping of overburden.
- (ii) All other conditions mentioned in the Ministry's letter No. J-11015/139/2012-IA.II(M) dated 22.08.2014 and corrigendum 15.12.20214 dated **shall remain the same, as applicable.**
- (iii) The PP shall plant "Ek Ped Maa Ke Naam" and the plantation shall be carried out in the earmarked greenbelt area as a part of tree plantation campaign and the details of the same shall be uploaded in the MeriLiFE Portal (<https://merilife.nic.in>).
- (iv) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
- (v) The Regional Office of this Ministry shall monitor compliance of the stipulated



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conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

- (vi) The SEIAA, Odisha may revoke or suspend the EC, if implementation of any of the above stipulated conditions is not satisfactory. The SEIAA, Odisha reserves the right to alter /modify the above conditions or stipulate any further condition in the interest of environment protection.
- (vii) The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/ High Court and any other Court of Law relating to the subject matter.
- (viii) This Environmental Clearance (EC) is subject to orders/judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.
- (ix) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Yours faithfully,

**Member Secretary**

**Copy to:**

1. **Joint Secretary (IA Division)**, Ministry of Environment, Forests and Climate Change Govt. of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi-110003 for information.
2. **Additional Chief Secretary**, Forests & Environment Dept., Government of Odisha for information.
3. **Additional Secretary to Govt**, Steel & Mines Department, Government of Odisha for information and necessary action.
4. **Member Secretary**, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-8, Bhubaneswar for information and necessary action.
5. **Additional Principal Conservator of Forests**, Integrated Regional Office (IRO), Ministry of Environment & Forests, A/3, Chandrasekharapur, Bhubaneswar for information and necessary action.
6. **Regional Director**, CGWA, South Eastern Region, Bhujal Bhawan, Khandagiri, Bhubaneswar, Pin-751030 for information.



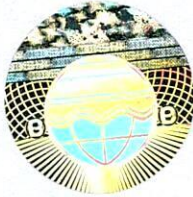
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7. **The Director of Mines**, Odisha, Bhubaneswar/DDM,Jajpur/DFO,Jajpur for information and necessary action.
8. **The Controller General**, Indian Bureau of Mines, Indira Bhawan, Civil Lines, Nagpur,Pin-440001 for information.
9. **Collector & DM**, Jajpur, District-Jajpur for Information and necessary action.
10. Guard file for record/Website/Parivesh Portal.

**Member Secretary**



**STATE POLLUTION CONTROL BOARD, ODISHA**

[DEPARTMENT OF FOREST, ENVIRONMENT &amp; CLIMATE CHANGE, GOVERNMENT OF ODISHA]

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012

Phone-2561909, Fax: 2562822, 2560955 E-mail: [paribesh1@ospcboard.org](mailto:paribesh1@ospcboard.org), Website: [www.ospcboard.org](http://www.ospcboard.org)**CONSENT ORDER**No. 2010 /

IND-I-CON-2576

Dt. 01.02.2025 /**CONSENT ORDER NO. 1239.**

Sub: Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.

Ref: Your online application ID No.6131365, Dated 23-01-2025 and letter dated 02.01.2025.

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Name of the Occupier & Designation: SRI BISWARANJAN KUMAR PADHI, AGENT-MINES

Address: AT/PO: KALIAPANI, SUKINDA, DIST: JAJPUR, PIN- 755047

This consent order is valid for the period upto 31.03.2026.

*This consent order supersedes the earlier consent order issued vide Board's Letter No.1937, dtd.13-02-2024.*

**Details of Production:**

| Sl. No | Product          | Quantity |
|--------|------------------|----------|
| 01.    | Chrome Ore (ROM) | 0.6 MTPA |

**Details of Mineral Handling/Processing Plants:**

|     |                                  |
|-----|----------------------------------|
| 01. | COB Plant of Capacity 1 x 20 TPH |
|-----|----------------------------------|

This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.



**CONSENT ORDER**  
**KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.**

Page 2 of 13

**A. Discharge permitted through the following outlet subject to the standard**

| Outlet No. | Description of outlet                                   | Point of discharge                  | Quantity of discharge KL/hr | Prescribed Standard |            |            |                             |                     |             |                       |           |
|------------|---|-------------------------------------|-----------------------------|---------------------|------------|------------|-----------------------------|---------------------|-------------|-----------------------|-----------|
|            |   |                                     |                             | pH                  | TSS (mg/l) | BOD (mg/l) | Fecal Coliform (MPN/100 ml) | Oil & Grease (mg/l) | Cr+6 (mg/l) | Total Chromium (mg/l) | Fe (mg/l) |
| 01.        | Septic tank (Domestic effluent)                         | Soak pit                            | --                          | 6.5 to 9.0          | <100       | 30         | 1000                        | --                  | --          | --                    | --        |
| 02.        | Mine drainage water / surface runoff / other wastewater | On land / inland surface water body | 199                         | 5.5 to 9.0          | 100        | --         | --                          | 10                  | 0.05        | 2.0                   | 3         |

**B. Emission permitted through the following stack subject to the prescribed standard**

| Chimney Stack No. | Description of Stack | Stack height (m) | Quantity of emission | Prescribed Standard |                 |                 |
|-------------------|----------------------|------------------|----------------------|---------------------|-----------------|-----------------|
|                   |                      |                  |                      | PM                  | SO <sub>2</sub> | NO <sub>x</sub> |
|                   |                      |                  |                      |                     |                 |                 |

**C. Disposal of solid waste permitted in the following manner**

| Sl. No. | Type of Solid waste  | Quantity generated (TPD)    | Quantity to be reused on site (TPD) | Quantity to be reused off site (TPD) | Quantity disposed off (TPD) | Description of disposal site. |
|---------|----------------------|-----------------------------|-------------------------------------|--------------------------------------|-----------------------------|-------------------------------|
| 01.     | Topsoil / overburden | As per approved mining plan | --                                  | --                                   | --                          | As per approved mining plan   |

**D. GENERAL CONDITIONS FOR ALL UNITS**

1. The consent is given by the Board in consideration of the particulars given in the application. Any change or alternation or deviation made in actual practice from the particulars furnished in the application will also be the ground for liable to review/variation/revocation of the consent order under section 27 of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 and to make such variations as deemed fit for the purpose of the Acts.
2. The occupier would immediately submit revised application for consent to operate to this Board in the event of any change in the quantity and quality of raw material / products / manufacturing process or quantity /quality of the effluent rate of emission / air pollution control equipment / system etc.
3. The applicant shall not change or alter either the quality or quantity or the rate of discharge or temperature or the route of discharge without the previous written permission of the Board.
4. The application shall comply with and carry out the directives/orders issued by the Board in this consent order without any negligence on his/her part. In case of non-compliance of any order/directives issued at any time and/or violation of the terms and conditions of this consent order, the applicant shall be liable for legal action as per the provisions of the Law.
5. The applicant shall make an application for grant of fresh consent at least 90 days before the date of expiry of this consent order.
6. The issuance of this consent does not convey any property right in either real or personal property or any exclusive privileges nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State laws or regulation.
7. This consent does not authorize or approve the construction of any physical structure or facilities or the undertaking of any work in any natural water course.
8. The applicant shall display this consent granted to him in a prominent place for perusal of the public and inspecting officers of this Board.
9. An inspection book shall be opened and made available to Board's Officers during the visit to the factory.
10. The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of effluent treatment system / air pollution control system / stack monitoring system any other particulars as may be pertinent to preventing and controlling pollution of Water / Air.
11. The applicant shall display suitable caution board at the place where the effluent is entering into any water-body or any other place to be indicated by the Board, indicating therein that the area into which the effluents are being discharged is not fit for the domestic use/bathing.
12. Storm water shall not be allowed to mix with the trade and/or domestic effluent on the upstream of the terminal manholes where the flow measuring devices will be installed.
13. The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, sewers and drains shall be leak-proof. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas.
14. The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems install or used by him to achieve with the term(s) and conditions of the consent.
15. Care should be taken to keep the anaerobic lagoons, if any, biologically active and not utilized as mere stagnation ponds. The anaerobic lagoons should be fed with the required nutrients for effective digestion. Lagoons should be constructed impervious.
16. The utilization of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent gaining access into any drainage channel or other water courses either directly or by overflow.
17. The effluent disposal on land, if any, should be done without creating any nuisance to the surroundings or inundation of the lands at any time.
18. If at any time the disposal of treated effluent on land becomes incomplete or unsatisfactory or create any problem or becomes a matter of dispute, the occupier must adopt alternate satisfactory treatment and disposal measures.
19. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.
20. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.
21. The applicant shall provide port holes for sampling the emissions and access platform for carrying out stack sampling and provide electrical outlet points and other arrangements for chimneys/stacks and other sources of emissions so as to collect samples of emission by the Board or the applicant at any time in accordance with the provision of the Acts or Rules made therein.
22. The applicant shall provide all facilities and render required assistance to the Board staff for collection of samples / stack monitoring / inspection.



**CONSENT ORDER**

KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

23. The applicant shall not change or alter either the quality or quantity or rate of emission or install, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.
24. No control equipments or chimney shall be altered or replaced or as the case may be erected or re-erected except with the previous approval of the Board.
25. The liquid effluent arising out of the operation of the air pollution control equipment shall be treated in the manner so as to meet the standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 (as amended).
26. The stack monitoring system employed by the applicant shall be opened for inspection to this Board at any time.
27. There shall not be any fugitive or episodal discharge from the premises.
28. In case of such episodal discharge/emissions the occupier shall take immediate action to bring down the emission within the limits prescribed by the Board and stop the operation of the plant if required. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.
29. The applicant shall keep the premises and air pollution control equipments clean and make all hoods, pipes, valves, stacks/chimneys leak proof. The air pollution control equipments, location, inspection chambers, sampling port holes shall be made easily accessible at all times.
30. Any upset condition in any of the plant/plants of the factory which is likely to result in increased effluent discharge/emission of air pollutants and / or result in violation of the standards mentioned shall be reported to the Headquarters and Regional Office of the Board by E-mail within 2 hours of its occurrence.
31. The occupier has to ensure that minimum three varieties of trees are planted at the density of not less than 1000 trees per acre. The trees may be planted along boundaries of the premises. This plantation is stipulated over and above the bulk plantation of trees in that area.
32. The solid waste such as sweeping, wastage packages, empty containers residues, sludge including that from air pollution control equipments collected within the premises of the shall be disposed off scientifically to the satisfaction of the Board.
33. All solid wastes arising in the premises shall be properly classified and disposed off to the satisfaction of the Board by :
  - i) Land fill in case of inert material, care being taken to ensure that the material does not give rise to leachate which may percolate into ground water or carried away with storm run-off.
  - ii) Controlled incineration, wherever possible in case of combustible organic material.
  - iii) Composting, in case of bio-degradable material.
34. Any toxic material shall be detoxicated if possible, otherwise be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The detoxication or sealing and burying shall be carried out in the presence of Board's authorized persons only. Letter of authorization shall be obtained for handling and disposal of hazardous wastes.
35. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard, vary all or any of such condition and thereupon the applicant shall be bound to comply with the conditions so varied.
36. The applicant, his/heirs/legal representatives or assignees shall have no claim whatsoever to the condition or renewal of this consent after the expiry period of this consent.
37. The Board reserves the right to review, impose additional conditions or condition, revoke change or alter the terms and conditions of this consent.
38. Notwithstanding anything contained in this conditional letter of consent, the Board hereby reserves to it the right and power under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Act by the Board.
39. The conditions imposed as above shall continue to be in force until revoked under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 A of Air (Prevention & Control of Pollution) Act, 1981.
40. The occupier shall comply to the conditions stipulated in CTE order issued by Odisha State Pollution Control Board and conditions stipulated in Environmental Clearances issued by MoEF&CC, Govt. of India.
41. The occupier shall abide by E(P) Act, 1986 and Rules framed there-under.
42. In case the consent fee is revised upward during this period, the industry shall pay the differential fees to the Board (for the remaining years) to keep the consent order in force. If they fail to pay the amount within the period stipulated by the Board the consent order will be revoked without prior notice.

**GENERAL CONDITIONS FOR UNITS WITH INVESTMENT OF MORE THAN Rs 50 CRORES, AND 17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES (RED A).**

1. The applicant shall analyse the emissions every month for the parameters indicated in TABLE .B & C as mentioned in this order and shall furnish the report thereof to the Board by the 10<sup>th</sup> of the succeeding month.
2. The applicant shall provide and maintain at his own cost three ambient air quality monitoring stations for monitoring Suspended Particulate Matter, Sulphur Dioxide, Oxides of Nitrogen, Hydro-Carbon, Carbon-Monoxide and monitor the same once in a day/week/fortnight/month. The data collected shall be maintained in a register and a monthly extract be furnished to the Board.
3. The applicant shall provide and maintain at his own cost a meteorological station to collect the data on wind velocity, direction, temperature, humidity, rainfall, etc. and the daily reading shall be recorded and the extract sent to the Board once in a month.
4. The applicant shall forward the following information to the Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar regularly.
  - a. Report of analysis of stack monitoring, ambient air quality monitoring meteorological data as required every month.
  - b. Progress on planting of trees quarterly.
5. The applicant shall install mechanical composite sampling equipment and continuous flow measuring / recording devices on the effluent drains of trade as well as domestic effluent. A record of daily discharge shall be maintained.
6. The following information shall be forwarded to the Member Secretary on or before 10<sup>th</sup> of every month.
  - a. Performance / progress of the treatment plant.
  - b. Monthly statement of daily discharge of domestic and/or trade effluent.
7. Non-compliance with effluent limitations
  - a) If for any reason the applicant does not comply with or is unable to comply with any effluent limitations specified in this consent, the applicant shall immediately notify the consent issuing authority by telephone and provide the consent issuing authority with the following information in writing within 5 days of such notification.
    - i) Causes of non-compliance
    - ii) A description of the non-compliance discharge including its impact on the receiving waters.
    - iii) Anticipated time of continuance of non-compliance if expected to continue or if such condition has been corrected the duration or period of non-compliance.
    - iv) Steps taken by the applicant to reduce and eliminate the non-complying discharge and
    - v) Steps to be taken by the applicant too prevent the condition of non-compliance.
  - b) The applicant shall take all reasonable steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.
  - c) Nothing in this consent shall be construed to relieve the applicant from civil or criminal penalties for non-compliance whether or not such non-compliance is due to factors beyond his control, such as break-down, electric failure, accident or natural disaster.
8. The applicant shall at his own cost get the effluent samples collected both before and after treatment and get them analysed at an approval laboratory every month for the parameters indicated in Part-D and shall submit in duplicate the report thereof to the Board.
9. The addition of various treatment chemicals should be done only with mechanical dosers and proper equipment for regulation of correct dosages determined daily and for proper uniform feeding. Crude practices such as dumping of chemicals in drains or sumps or trickling of acids or alkalies arbitrarily and utilizing poles for stirring etc. should not be resorted to.
10. In the disposal of treated effluent on land for irrigation, the industry shall keep in view of the need for;
  - a) Rotation of crops
  - b) Change of point of application of effluent on land
  - c) A portion of land kept fallow.
11. The adoption of these would avoid soil becoming sick or slate, the industry may ensure this in consultation with the Agriculture Department.
12. It is the sole responsibility of the industry to ensure that there are no complaints at any time from the royats in the surrounding areas as a result of discharge of sewage or trade effluent if any.
13. Proper housekeeping shall be maintained by a dedicated team.
14. The industry must constitute a team of responsible and technically qualified personnel who will ensure continuous operation of all pollution control devices round the clock (including night hours) and should be in a position to explain the status of operation of the pollution control measures to the inspecting officers of the Board at any point of time. The name of these persons with their contact telephone numbers shall be intimated to the concerned. Regional Officer and Head Office of the Board and in case of any change in the team it shall be intimated to the Board immediately.



**E. SPECIAL CONDITIONS:**

- 1) Mining operation is subject to availability of all other statutory clearances required under relevant Acts/Rules.
- 2) This consent order is subject to permission from Steel and Mines Department, Government of Odisha and State Forest Department for resumption of mining operation.
- 3) The quantity of production shall be determined on a monthly pro-rata basis from the date of issue of this order. If the date of issue is 15<sup>th</sup> of the month, or earlier, then the entire month will be considered for calculation, otherwise the quantity shall be determined from the next month on pro-rata basis.
- 4) **The mine authority shall submit a time-bound action plan within 15 days time to complete the following jobs for improvement of environmental status of the mine.**
  - i) Repair of damaged portion of the internal road adjacent to the OB dump-1.
  - ii) Replacement of the sensors at EQMS with new EQMS sensor at the inlet and outlet of ETP to resume transfer of monitoring data to SPCB Server. Till such time, record keeping shall be done of physical monitoring of water at ETP inlet and outlet and quantity of chemical consumed in ETP.
  - iii) Upgradation of existing STP with 40m<sup>3</sup>/day.
  - iv) Deployment of a mist canon for strengthening of air pollution control measures at the ore stockyard and repair of existing fixed water sprinkling system alongside side road.
  - v) Installation of dry fog system at the feeding hopper of COB plant by replacing the existing manual water sprinkling facility.
- 5) Wet drilling shall be practiced or suitably designed dust extractor shall be provided for dry drilling to prevent generation of dust in the work environment.
- 6) Pre-wetting of blasting site and controlled blasting shall be practiced. Blasting shall be carried out during day time.
- 7) Water sprinkling shall also be carried out on haul roads at frequent interval so that it should always remain in wet condition. Haulage roads shall be devoid of ruts and potholes and shall be maintained properly to avoid generation of dust during movement of vehicles.



- 8) Mechanised wheel washing facility for the ore transport vehicles shall be provided at the exit point of the mine. The wheel washing facility shall be integrated with complete recirculation system. The wheel washing facility shall be upgraded to body washing facility with wastewater recirculation system.
- 9) The vehicles carrying ore for transportation from the mine shall be covered with tarpaulin.
- 10) Regular water sprinkling on mineral transportation roads passing through the habitation area as well as other strategic point on the National Highway shall be done jointly by the mining lessees in consultation with the Regional Officer.
- 11) Regular monitoring of ambient air quality shall be carried out at three appropriate places and consolidated monitoring report shall be furnished to the Board once in a year. The permanent monitoring stations shall be fixed in consultation with the Regional Officer of the Board.
- 12) Ambient air quality of the mine shall meet the prescribed standards for industrial area.
- 13) Wastewater generated from the ore beneficiation plant shall be completely reused.
- 14) The slime generated from the ore beneficiation plant shall be disposed of safely as per mining plan and action shall be taken to prevent the contamination of ground water due to its disposal.
- 15) Retention wall shall be constructed at the toe of OB dump with provision of garland drain. Provision shall be made to divert the runoff from OB, ore stack yard and other areas of the mine to the ETP. Garland drains, channels and sedimentation pits constructed for the purpose shall be desilted as and when required and after monsoon.
- 16) Mine drainage water shall be used for wet beneficiation of sub-grade ore. Excess water if any, shall be discharged into surface water body after adequate treatment in the ETP. The quality of the treated wastewater shall conform to the prescribed standard as stated in Part A(SI. no.2) of the consent order. The treated wastewater of ETP shall also be utilized for sprinkling activities at various sources of generation of dust.
- 17) The ETP and online continuous monitoring system at the inlet & outlet of ETP with data transfer facility to SPCB server shall be effectively operated and the quality of treated wastewater shall never exceed the prescribed standards (Part-A, SI. No. 2).



**CONSENT ORDER**  
KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

- 18) Domestic effluents shall be treated in a sewage treatment plant (STP). The quality of the treated wastewater from STP shall conform to the prescribed standard. (Part-A, Sl. No.1).
- 19) Oil and grease trap with sedimentation pit shall be provided for treatment of workshop effluent and treated effluent shall remain within the following prescribed standards and shall be re-used for washing of vehicles:
- |              |   |          |
|--------------|---|----------|
| pH           | - | 6.5 -8.5 |
| TSS          | - | 50 mg/l  |
| Oil & Grease | - | 10 mg/l  |
| COD          | - | 150 mg/l |
- 20) Overburden / waste rock shall be properly stacked in the earmarked areas approved by IBM and shall be suitably terraced and stabilized through vegetative cover or otherwise.
- 21) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), post-monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly.
- 22) Adequate measures shall be taken for control of noise levels below 85 dB (A) in work zone.
- 23) Ambient Air Quality monitoring data, Noise Monitoring data & Water/Waste Water Quality Monitoring data shall be electronically displayed at the entry point of the mine or at a suitable location of the mine.
- 24) The height of the stack connected to DG sets of capacity more than 800 KVA shall conform to the following:
- i)  $14Q^{0.3}$ , Q = Total SO<sub>2</sub> emission from the plant in kg/hr.
  - ii) Minimum 6m. above the building where generator set is installed.
  - iii) 30 m.
- 25) The height of the stack connected to DG set of capacity less than and upto 800 KVA shall conform to the following:
- i)  $H = h + 0.2\sqrt{KVA}$
  - ii) h= Height of the building where it is installed in meter
  - iii) KVA = Capacity of DG set
  - iv) H = Height of the stack in meter above ground level.
- 26) All DG sets installed before 1.7.2004 shall be scrapped. DG sets complying with either State-I or Stage-II emission norms shall reduce Particulate Matter Emission by 70% by



installing RECD without affecting any other emission parameters as per the CPCB guidelines and Board's letter vide No.17927, dated 14.11.2023 and letter No.7146, dated 10.05.2024, in this regard.

- 27) Plantation of trees shall be undertaken in the colony/ township, over top soil dumps, OB dumps, along the side of haul road and in other areas of the mines not being utilized for mining activities. The mine shall take up avenue plantation and plantation in nearby village areas in consultation with DFO/Horticulture Department. The plantation details shall be submitted to the Board before end of March every year.
- 28) A copy of the annual return (annual return submitted to IBM, Govt. of India/ Directorate of Mines, Govt. of Odisha) shall be submitted to the Board every year.
- 29) The environmental statement report for the financial year ending 31<sup>st</sup> March shall be submitted to the Board in Form-V on or before 30<sup>th</sup> September every year.
- 30) The mine shall submit a declaration by 30<sup>th</sup> April every year that all pollution control systems are in good condition, are operated efficiently and ambient air quality as well as wastewater quality are conforming to the prescribed standards.

**MEMBER SECRETARY**  
**STATE POLLUTION CONTROL BOARD, ODISHA**

TO,

**SRI BISWARANJAN KUMAR PADHI, AGENT-MINES,**  
**KALIAPANI CHROMITE MINES OF**  
**M/S. BALASORE ALLOYS LIMITED,**  
**AT/PO: KALIAPANI, DIST: JAJPUR**

Memo No. \_\_\_\_\_/Dt. \_\_\_\_\_/

Copy forwarded to :

- i) Regional Officer, State Pollution Control Board, **Kalinganagar**
- ii) District Collector, **Jajpur**
- iii) Director of Mines, Govt. of Odisha, Bhubaneswar,
- iv) Director, Environment-cum-Special Secretary, F, E &CC Dept., Govt. of Odisha, Bhubaneswar.
- v) D.F.O, **Cuttack**
- vi) Deputy Director of Mines, **Jajpur Road**
- vii) Chief Env. Scientist, Central Lab. SPCB, Bhubaneswar
- viii) Addl. Chief Env. Engineer (Hazardous Waste Management Cell)
- ix) Consent Register

**CHIEF ENV. ENGINEER (M)**  
**STATE POLLUTION CONTROL BOARD, ODISHA**



**CONSENT ORDER**  
**KALAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.**

**GENERAL STANDARDS FOR DISCHARGE OF  
ENVIRONMENTAL POLLUTANTS**

**GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART – A : EFFLUENTS**

| Sl. No. | Parameters  | Standards  |               |                     |  |
|---------|---|--|---------------|---------------------|--|
|         |   | Inland surface   | Public sewers | Land for irrigation | Marine Coastal Areas   |
|         |   | (a)  | (b)           | (c)                 | (d)  |
| 1.      | Colour & odour  | Colourless/<br>Odourless as far<br>as practicable                                | --            | See 6 of<br>Annex-1 | See 6 of Annex-1   |
| 2.      | Suspended Solids (mg/l)   | 100  | 600           | 200                 | a. For process<br>wastewater – 100<br>b. For cooling water<br>effluent 10% above<br>total suspended<br>matter of influent. |
| 3.      | Particular size of SS   | Shall pass 850   | --            | --                  | --   |
| 5.      | pH value  | 5.5 to 9.0   | 5.5 to 9.0    | 5.5 to 9.0          | 5.5 to 9.0   |
| 6.      | Temperature   | Shall not exceed<br>5 <sup>o</sup> C above the<br>receiving water<br>temperature | --            | --                  | Shall not exceed 5 <sup>o</sup> C<br>above the receiving<br>water temperature  |
| 7.      | Oil & Grease mg/l max.  | 10   | 20            | 10                  | 20   |
| 8.      | Total residual chlorine   | 1.0  | --            | --                  | 1.0  |
| 9.      | Ammonical nitrogen (as<br>N) mg/l max.                                  | 50   | 50            | --                  | 50   |
| 10.     | Total Kjeldahl nitrogen<br>(as NH <sub>3</sub> ) mg/1 max.              | 100  | --            | --                  | 100  |
| 11.     | Free ammonia (as NH <sub>3</sub> )<br>mg/1 max.                         | 5.0  | --            | --                  | 5.0  |
| 12.     | Biochemical Oxygen<br>Demand (5 days at<br>20 <sup>o</sup> C) mg/1 max. | 30   | 350           | 100                 | 100  |
| 13.     | Chemical Oxygen<br>Demand, mg/1 max.                                    | 250  | --            | --                  | 250  |
| 14.     | Arsenic (as As) mg/1<br>max.  | 0.2  | 0.2           | 0.2                 | 0.2  |
| 15.     | Mercury (as Hg) mg/1<br>max.  | 0.01   | 0.01          | --                  | 0.001  |
| 16.     | Lead (as pb) mg/1 max.  | 01.  | 1.0           | --                  | 2.0  |
| 17.     | Cardmium (as Cd) mg/1<br>max.   | 2.0  | 1.0           | --                  | 2.0  |
| 18.     | Hexavalent Chromium<br>(as Cr + 6) mg/l max.                            | 0.1  | 2.0           | --                  | 1.0  |



**CONSENT ORDER**  
KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

| Sl. No. | Parameters   | Standards  |  |  |  |
|---------|--|--|--|--|--|
|         |  | Inland surface                                       | Public sewers  | Land for irrigation                                  | Marine Costal Areas                                  |
|         |  | (a)  | (b)  | (c)  | (d)  |
| 19.     | Total Chromium (as Cr) mg/l max.                                   | 2.0  | 2.0  | --   | 2.0  |
| 20.     | Copper (as Cu) mg/l max.   | 3.0  | 3.0  | --   | 3.0  |
| 21.     | Zinc (as Zn) mg/l max.   | 5.0  | 15   | --   | 15   |
| 22.     | Selenium (as Sc) mg/l max.   | 0.05   | 0.05   | --   | 0.05   |
| 23.     | Nickel (as Nil) mg/l max.  | 3.0  | 3.0  | --   | 5.0  |
| 24.     | Cyanide (as CN) mg/l max.  | 0.2  | 2.0  | 0.2  | 0.02   |
| 25.     | Fluoride (as F) mg/l max.  | 2.0  | 15   | --   | 15   |
| 26.     | Dissolved Phosphates (as P) mg/l max.                              | 5.0  | --   | --   | --   |
| 27.     | Sulphide (as S) mg/l max.  | 2.0  | --   | --   | 5.0  |
| 28.     | Phenolic compounds as (C <sub>6</sub> H <sub>5</sub> OH) mg/l max. | 1.0  | 5.0  | --   | 5.0  |
| 29.     | Radioactive materials  |  |  |  |  |
|         | a. Alpha emitter micro curle/ml.                                   | 10 <sup>7</sup>                                      | 10 <sup>7</sup>                                      | 10 <sup>8</sup>                                      | 10 <sup>7</sup>                                      |
|         | b. Beta emitter micro curle/ml.                                    | 10 <sup>6</sup>                                      | 10 <sup>6</sup>                                      | 10 <sup>7</sup>                                      | 10 <sup>6</sup>                                      |
| 30.     | Bio-assay test   | 90% survival of fish after 96 hours in 100% effluent | 90% survival of fish after 96 hours in 100% effluent | 90% survival of fish after 96 hours in 100% effluent | 90% survival of fish after 96 hours in 100% effluent |
| 31.     | Manganese (as Mn)  | 2 mg/l   | 2 mg/l   | --   | 2 mg/l   |
| 32.     | Iron (Fe)  | 3 mg/l   | 3 mg/l   | --   | 3 mg/l   |
| 33.     | Vanadium (as V)  | 0.2 mg/l   | 0.2 mg/l   | --   | 0.2 mg/l   |
| 34.     | Nitrate Nitrogen   | 10 mg/l  | --   | --   | 20 mg/l  |



NATIONAL AMBIENT AIR QUALITY STANDARDS

| Sl. No. | Pollutants   | Time Weighed Average     | Concentrate of Ambient Air                   |  |  |
|---------|--|--------------------------|--|--|--|
|         |  |                          | Industrial Residential, Rural and other Area | Ecologically Sensitive Area (notified by Central Government) | Methods of Measurement   |
| (1)     | (2)  | (3)                      | (4)  | (5)  | (6)  |
| 1.      | Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>                            | Annual *<br>24 Hours **  | 50<br>80                                     | 20<br>80   | -Improved west and Gaeke<br>- Ultraviolet fluorescence   |
| 2.      | Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>                           | Annual *<br>24 Hours **  | 40<br>80                                     | 30<br>80   | - Modified Jacob & Hochheiser ( Na-Arsenite)<br>- Chemiluminescence                                    |
| 3.      | Particulate Matter (size less than 10µm) or PM <sub>10</sub> µg/m <sup>3</sup>   | Annual *<br>24 Hours **  | 60<br>100                                    | 60<br>100  | -Gravimetric<br>- TOEM<br>- Beta Attenuation   |
| 4.      | Particulate Matter (size less than 2.5µm) or PM <sub>2.5</sub> µg/m <sup>3</sup> | Annual *<br>24 Hours **  | 40<br>60                                     | 40<br>60   | -Gravimetric<br>- TOEM<br>- Beta Attenuation   |
| 5.      | Ozone (O <sub>3</sub> ) µg/m <sup>3</sup>  | 8 Hours **<br>1 Hours ** | 100<br>180                                   | 100<br>180   | - UV Photometric<br>- Chemiluminescence<br>- Chemical Method   |
| 6.      | Lead (Pb) µg/m <sup>3</sup>  | Annual *<br>24 Hours **  | 0.50<br>1.0                                  | 0.50<br>1.0  | -AAS/ICP method after sampling on EMP 2000 or equivalent filter paper.<br>- ED-XRF using Teflon filter |
| 7.      | Carbon Monoxide (CO) mg/m <sup>3</sup>   | 8 Hours **<br>1 Hours ** | 02<br>04                                     | 02<br>04   | - Non Dispersive Infra Red (NDIR) Spectroscopy   |
| 8.      | Ammonia (NH <sub>3</sub> ) µg/m <sup>3</sup>                                     | Annual*<br>24 Hours**    | 100<br>400                                   | 100<br>400   | -Chemiluminescence<br>- Indophenol Blue Method   |
| 9.      | Benzene (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>                       | Annul *                  | 05   | 05   | -Gas Chromatography based continuous analyzer<br>- Adsorption and Desorption followed by GC analysis   |
| 10.     | Benzo (a) Pyrene (BaP)-Particulate phase only, ng/m <sup>3</sup>                 | Annual*                  | 01   | 01   | -Solvent extraction followed by HPLC/GC analysis   |
| 11.     | Arsenic (As), ng/m <sup>3</sup>  | Annual*                  | 06   | 06   | -AAS/ICP method after sampling on EPM 2000 or equivalent filter paper                                  |
| 12.     | Nickel (Ni),ng/m <sup>3</sup>  | Annual*                  | 20   | 20   | -AAS/ICP method after sampling on EPM 2000 or equivalent filter paper                                  |

\* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

\*\* 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.



**REGIONAL OFFICE, KALINGANAGAR**  
**STATE POLLUTION CONTROL BOARD, ODISHA**

[Department of Forest, Environment and Climate Change, Government of Odisha]  
At- Dhabalagiri, PO: F. C. Project, Jajpur Road  
Dist- Jajpur-755020, Odisha, India

No. 3694 KNG/MINES/01

Date 09.12.2025  
e-mail/ Regd. Post

To,

The Agent Mines  
Kaliapani Chromite Mines of M/s. Balasore Alloys Ltd.  
At/PO: Kaliapani, Sukinda, Dist: Jajpur

Sub: Exceedance of Hexavalent chromium (Cr<sup>+6</sup>) in Damsala Nallah - Reg.

Ref: Consent to operate issued Order No.1239, vide letter no. 2010 Dtd. 01.02.2025.

Sir,

In inviting a reference to the above cited subject, it is to inform you that during mines river water quality monitoring conducted on 24th Nov. 2025 for verifying the water quality of the Damsala Nallah is found to be higher than the Board's prescribed standards in the following locations (**Copy of the Analysis report is Enclosed**);

| Sl. No.   | Sources of Sampling / Location   | Parameters       |            |                         |
|---|--|------------------|------------|-------------------------|
|   |  | pH               | TSS (mg/l) | Cr <sup>+6</sup> (mg/l) |
| 01  | Damsala at Village Kansa (Checkdam)  | 7.08             | 12         | 0.010                   |
| 02  | Damsala at Kamarda after confluence of Nallah from Daitari Range   | 7.01             | 07         | 0.012                   |
| 03  | Damsala at Down the Bridge in front of Tailangi Chromite Mines   | 7.69             | 08         | 0.031                   |
| 04  | Damsala at Down the Bridge connecting Main Road to Ostapal Chromite Mines of M/s. FACOR Ltd. (Gurujang Bus Stop Rest Shed)   | 8.15             | 08         | <b>0.101</b>            |
| 05  | Damsala Near Tata Intake Point   | 7.44             | 09         | <b>0.098</b>            |
| 06  | Damsala Near EQMS of OMC   | 7.70             | 12         | <b>0.125</b>            |
| 07  | Damsala Near Bridge connecting Main Road to Kathapal   | 7.66             | 09         | <b>0.107</b>            |
| <b>Standards / Regulatory Limits</b><br><b>Tolerance limit for inland surface water subject to pollution (IS : 2296 - 1982), for Class 'C' (Drinking water source with conventional treatment followed by disinfection)</b> |  | <b>6.5 - 8.5</b> | <b>--</b>  | <b>0.05</b>             |
| 01  | Water Sample collected from the common drain of Kaliapani Chromite Mines of M/s. Balasore Alloys Ltd. & Kaliapani Chromite Mines of M/s. Jindal Stainless Ltd. leading to Damsala Nallah | 8.08             | 36         | <b>0.091</b>            |
| <b>Standards</b>  |  | <b>5.5-9.0</b>   | <b>100</b> | <b>0.05</b>             |

Therefore, to maintain the water quality of Damsala Nallah; you are directed to take adequate treatment of your mine drainage discharge / Surface runoff through ETP before discharging to Damsala Nallah. Action taken report shall be submitted to this office within **7 days** from the date of issue of this letter with a copy to Head office.

Encl: As above

Yours faithfully,

*M. Mohanta*  
09/12/25

REGIONAL OFFICER

Memo no. 3695 / Dtd. 09.12.2025

Copy forwarded to The Member Secretary, SPCB, Odisha for your kind information.

*M. Mohanta*  
09/12/25

REGIONAL OFFICER



**REGIONAL OFFICE, KALINGA NAGAR**  
**STATE POLLUTION CONTROL BOARD, ODISHA**  
 [DEPARTMENT OF FOREST, ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF ODISHA]  
 At: Dhabalagiri (In Front of OMC Guest House) PO: Ferro Chrome Project,  
 Dist: Jajpur-755020, Odisha, India

**(Water Analysis Report)**

Lab. Ref. No.: WW / I / 25 / 11 - 139

Date: 01.12.2025

Name and Address of the Industry / Source : Damsala River,  
 Sukinda Chromite Valley  
 Dist.: Jajpur

Date of Sampling : 24<sup>th</sup> November, 2025

Sample collected and submitted by : Sri S. S. Dwibedi, JLA  
 Sri D. Malik, Field Attend.

Date of Submission of Sample : 24.11.2025

| Sl. No.  | Sources of Sampling / Location   | Parameters |            |                         |
|--|--|------------|------------|-------------------------|
|  |  | pH         | TSS (mg/l) | Cr <sup>+6</sup> (mg/l) |
| 01   | Damsala at Village Kansa (Checkdam)  | 7.08       | 12         | 0.010                   |
| 02   | Damsala at Kamarda after confluence of Nallah from Daitari Range   | 7.01       | 07         | 0.012                   |
| 03   | Damsala at Down the Bridge in front of Tailangi Chromite Mines   | 7.69       | 08         | 0.031                   |
| 04   | Damsala at Down the Bridge connecting Main Road to Ostapal Chromite Mines of M/s. FACOR Ltd. (Gurujang Bus Stop Rest Shed) | 8.15       | 08         | 0.101                   |
| 05   | Damsala Near Tata Intake Point   | 7.44       | 09         | 0.098                   |
| 06   | Damsala Near EQMS of OMC   | 7.70       | 12         | 0.125                   |
| 07   | Damsala Near Bridge connecting Main Road to Kathapal   | 7.66       | 09         | 0.107                   |
| <b>Standards / Regulatory Limits</b><br>Tolerance limit for inland surface water subject to pollution (IS : 2296 - 1982), for Class 'C' (Drinking water source with conventional treatment followed by disinfection) |  | 6.5 – 8.5  | --         | 0.05                    |

Sample Analysed by:

S. Dwibedi  
 JLA 01/12/25  
 H. D. Malik  
 01/12/25

M. M. J.  
 Regional Officer



**REGIONAL OFFICE, KALINGA NAGAR**  
**STATE POLLUTION CONTROL BOARD, ODISHA**  
 [DEPARTMENT OF FOREST, ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF ODISHA]  
 At: Dhabalagiri (In Front of OMC Guest House) PO: Ferro Chrome Project,  
 Dist: Jajpur-755020, Odisha, India

**(Water Analysis Report)**

Lab. Ref. No.: WW / 1 / 25 / 11 – 140

Date: 01.12.2025

Name and Address of the Industry / Source : Sukinda Chromite Valley  
 Kaliapani, Sukinda  
 Dist.: Jajpur

Date of Sampling : 24<sup>th</sup> October, 2025

Sample collected and submitted by : Sri S. S. Dwibedi, JLA  
 Sri J. K. Sahoo, Lab. Attendant

Date of Submission of Sample : 24.10.2025

| Sl. No.          | Sources of Sampling / Location   | Parameters       |            |                         |
|------------------|--|------------------|------------|-------------------------|
|                  |  | pH               | TSS (mg/l) | Cr <sup>6+</sup> (mg/l) |
| 01               | Water Sample collected from the common drain of Kaliapani Chromite Mines of M/s. Balasore Alloys Ltd. & Kaliapani Chromite Mines of M/s. Jindal Stainless Ltd. leading to Damsala Nallah | 8.08             | 36         | 0.091                   |
| <b>Standards</b> |  | <b>5.5 - 9.0</b> | <b>100</b> | <b>0.05</b>             |

Sample Analysed by:

*S. S. Dwibedi*  
 JLA 01/12/25

*S. J. K. Sahoo*  
 01-12-25

*M. J.*  
 01/12/25  
 Regional Officer

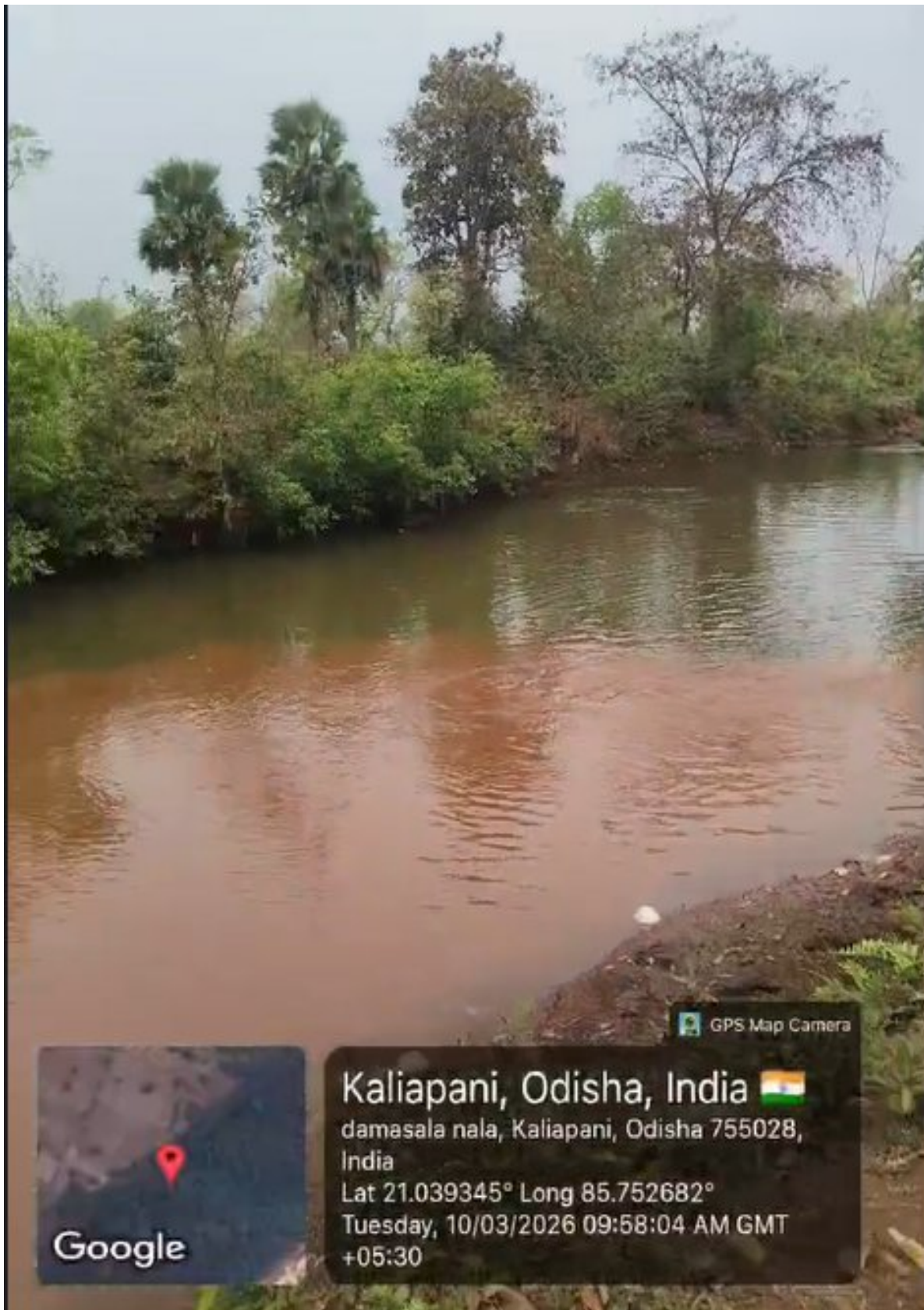
BELOW ATTACHED PHOTOGRAPH DATED 14/03/2026 SUGGESTS THE RESPONDENT UNIT IS DIRECTLY DISCHARGING POLLUTED WATER INTO THE DAMSALA NALLAH.



BELOW ATTACHED PHOTOGRAPH DATED 10/03/2026 SUGGESTS THE RESPONDENT UNIT IS DIRECTLY DISCHARGING POLLUTED WATER INTO THE DAMSALA NALLAH.



BELOW ATTACHED PHOTOGRAPH DATED 10/03/2026 SUGGESTS THE RESPONDENT UNIT IS DIRECTLY DISCHARGING POLLUTED WATER INTO THE DAMSALA NALLAH.







सत्यमेव जयते

**Government of India**  
**Ministry of Jal Shakti**  
**D/O Water Resources, River Development & Ganga Rejuvenation**

**REPORT ON**

**Ground Water Quality in Sukinda Valley**  
**Jajpur District, Odisha**

**For Submission before the**

**Hon'ble National Green Tribunal, Eastern Zone Bench, Kolkata**



**Central Ground Water Board**  
**South Eastern Region, Bhubaneswar**  
**June 2025**



AnyScanner



AnyScanner



**Central Ground Water Board  
South Eastern Region, Bhubaneswar**

**Ground Water Quality in Sukinda Valley, Jajpur District, Odisha**

**Report Preparation  
by**

**Smt. Mausumi Sahoo, Scientist-D  
Sh. Bibhuti Bhushan Sahoo, Scientist-C  
Sh. Sinosh P K, Scientist-B**

**Supervision & Guidance  
Dr. B K Sahoo, Regional Director**

**June 2025**

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## GROUND WATER QUALITY IN SUKINDA VALLEY, JAJPUR DISTRICT, ODISHA

### 1.0 Introduction

In pursuant to the OA No.73/2024/EZ filed before the Hon'ble National Green Tribunal (NGT), Eastern Zone Bench, Kolkata; the Hon'ble NGT has constituted a joint committee vide its hearing dated 21.03.2024 comprising of the following members to enquire into the allegations made in the said OA related to water pollution in Sukinda Valley and submit a fact finding report:-

- i. Senior Scientist, Odisha Pollution Control Board,
- ii. Senior Scientist, Central Pollution Control Board,
- iii. Senior Officer, Central Ground Water Board, and
- iv. Collector & District Magistrate, Jajpur, or his representative not below the rank of Additional District Magistrate.

The joint committee has submitted the fact finding report before the Hon'ble NGT with finding of the Chromium (VI) contamination at nine sampling points and also gave the suggestion that the extent of contamination of ground water in the different regions of Sukinda Valley and surrounding area is a matter of further investigation by the competent agency. The Hon'ble NGT vide its hearing dated 04.07.2024 directed the Central Ground Water Board to further investigate the matter on its own and to file affidavit showing what action has been taken on the Report of the Joint Inspection Committee.

Following the directions of the Hon'ble NGT, the Central Ground Water Board, Bhubaneswar has taken up a study to establish the extent of Cr (VI) contamination in ground water in Sukinda Valley area. The study area covers the Sukinda Chromite Valley along with its buffers having a geographical area of around 180 square kilometres and is located in Sukinda block, Jajpur district of Odisha state. The area falls between north latitudes 21.0540 & 21.1120 and east longitudes 85.9000 & 85.6860 (Plate-1). The area receives good amount of rainfall with an annual average precipitation of 1800 mm.

The area known as Sukinda ultramafic field is famous for its Chromite reserve which accounts for around 95% of the chromite reserve of the country which are associated with the ultramafic complexes. The Chromite ore is mined in the area through mostly opencast method by various private and public sector companies.

The Sukinda ultramafic field is confined to an east-west trending valley lying between the Daitari hill range in the north and the Mahagiri range in the south. The area has a width of 2 to 5 km and extends for a length of nearly 25 km in an ENE-WSW direction with general slope from north east to south west. The drainage or natural water channels in the area is towards North West and it finally joins the Damsala Nalla which is flowing NE-SW and is the main



drainage in the area. The Damsala Nala crosses the valley along the length and joins the River Brahmani that finally meets the Bay of Bengal.

## 2.0 Geology and Hydrogeology

Geologically the area is underlain by quartzites, ultramafics- mainly dunite, peridotite & pyroxenites, schists & phyllites and younger granites of Iron Ore Super Group. The Iron Ore Super Group possesses schists, phyllites and quartzites which were later intruded by ultramafic complex consisting of dunite, peridotite & pyroxenites in the Sukinda Valley. These ultramafics have been extremely weathered into a mass of talc, serpentinite and limonite which have been subsequently lateritised during quaternary period. The chromite ores occur as bands within the ultramafic body.

The occurrence and distribution of ground water in an area are governed by the underlying geological formations and hydrogeological characteristics of the surroundings. The hydrogeology of the area broadly describes the disposition of water bearing formations, occurrence of ground water and their yield potentials, ground water regime conditions in terms of depth to water levels.

Hydrogeologically the area is having two aquifers, the upper phreatic (unconfined) and the deeper semi-confined aquifer. Ground water in the area occurs both in phreatic and semi-confined conditions. The upper weathered portion of the crystalline rocks forms the phreatic aquifer. Phreatic aquifer occurs in entire area except rocky outcrops and has formed by the weathering of crystalline formations. This aquifer generally occurs down to a depth of 20 meter below ground level (mbgl) with maximum depth of up to 30 mbgl in certain areas and ground water is extracted from this aquifer mostly through dug wells (DW). The depth of the dug wells goes up to maximum of 15 mbgl.

Below the phreatic aquifer, ground water occurs in the fractures and joints within the crystalline rocks which form the semi-confined aquifer in the area. Ground water from this aquifer is extracted mainly through hand pumps (HP) and bore wells (BW). The depth of the hand pumps usually goes up to 60 mbgl and bore wells up to 120 mbgl. Ground water in the area has been extracted through dug wells, hand pumps and bore wells for both domestic as well as agricultural purpose by the local public.

To study the hydrogeology of the area, water levels in the area have been measured through 26 nos. of dug wells and 27 nos. of hand pumps during both pre-monsoon and post-monsoon seasons in the year 2024. The water levels measured through dug wells represent the phreatic aquifer and the water levels measured through hand pumps represent the deeper semi-confined aquifer in the area. The analysis of water levels measured in the area show that in the phreatic aquifer, the depth to water level during pre-monsoon season varies from 2.26 meter to 12.12 meter below ground level with an average water level of 6.8 mbgl (plate-2). Similarly depth to water level during post-monsoon season in this aquifer varies from 0.51

meter to 8.65 meter below ground level with an average water level of 4.28 mbgl (plate-3) in the area.

Similarly, in the semi-confined aquifer, the depth to water level during pre-monsoon season varies from 2.8 meter to 18.4 meter below ground level with an average water level of 9.4 mbgl (plate-4) and during post-monsoon season the depth to water level varies from 1.65 meter to 16.1 meter below ground level with an average water level of 7.1 mbgl (plate-5) in the area.

The depth to water levels in the semi-confined aquifer remain deeper as compared to the phreatic aquifer during both pre- and post-monsoon seasons. There has been a rise of water levels during post-monsoon season as compared to the pre-monsoon season in both phreatic as well as in the semi-confined aquifers as a result of recharge due to rainfall in the area. The ground water flow direction in the area is towards south-west. The Damasala Nala during its flow from ground water system which is effluent in nature. The hydrogeology of the study area is shown in plate-6.

### 3.0 Water Sampling and Analysis

In order to study the quality of water in Sukinda Valley, 233 water samples were collected from different locations in the study area during field investigation in the year 2024. Out of 233 samples, 183 were collected during pre-monsoon season and 50 were collected during post-monsoon season. Post-monsoon sampling was primarily conducted at locations that showed elevated Cr(VI) concentrations exceeding 0.05 mg/l during the pre-monsoon season, along with a few additional sites in the surrounding areas. Spatially, the samples were collected both from areas in close proximity to the mines and from locations up to 6 km away. The samples were collected from hand pumps, bore wells, dug wells, effluent treatment plants (ETP) and mine pits of different mining companies. The location of the samples is presented in plate-7. In addition to these groundwater samples, samples were also collected from surface water bodies like pond, Damsala Nala and Bramhani River to assess the quality. Multiple samples were collected from different sources from the same village to study the quality of water during both pre- and post-monsoon seasons. The collections of samples were also carried out from both dug wells as well as from hand pumps to ascertain the quality of water in two different aquifers available in the area.

All samples were collected in accordance with the standard procedure and analysed for the parameters like, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Hardness, Total Alkalinity, Calcium, Magnesium, Sodium, Potassium, Carbonate, Bicarbonate, Chloride, Sulphate, Nitrate and Fluoride by following the standard procedures laid down in "Standard Methods for the Examination of Water and Wastewater, 23rd Edition, American Public Health Association (APHA), 2017 in CGWB's Regional Chemical Laboratory. The samples were also analysed for concentration of chromium (VI) and were determined colorimetrically using the

diphenylcarbazine method, as per EPA Method 7196. The location and source of sampling sites are given in table-1.

**Table-1: Location and source of samples collected from Sukinda Valley**

| Sl. No. | Village      | Number of Sources | Ground Water Source |       |    | Surface Water Source |      |          | Mine      |            |     | Spring |
|---------|--------------|-------------------|---------------------|-------|----|----------------------|------|----------|-----------|------------|-----|--------|
|         |              |                   | DW                  | TW/BW | HP | River                | Pond | Mine Pit | ETP Inlet | ETP Outlet | WTP |        |
| 1       | Aradapal     | 3                 | 1                   |       | 2  |                      |      |          |           |            |     |        |
| 2       | Badakhaman   | 1                 |                     |       | 1  |                      |      |          |           |            |     |        |
| 3       | Balipada     | 17                |                     |       | 15 | 2                    |      |          |           |            |     |        |
| 4       | Balipura     | 4                 |                     |       | 2  |                      |      |          |           |            |     | 2      |
| 5       | Benagadia    | 7                 | 2                   |       | 5  |                      |      |          |           |            |     |        |
| 6       | Bhimanagar   | 15                | 1                   |       | 14 |                      |      |          |           |            |     |        |
| 7       | Chingudipal  | 6                 | 2                   |       | 3  | 1                    |      |          |           |            |     |        |
| 8       | Chirgunia    | 5                 | 1                   | 1     | 2  | 1                    |      |          |           |            |     |        |
| 9       | Chrome nagar | 1                 |                     |       | 1  |                      |      |          |           |            |     |        |
| 10      | Dhabahali    | 4                 | 1                   |       | 3  |                      |      |          |           |            |     |        |
| 11      | Ghagiasahi   | 3                 |                     |       | 1  | 2                    |      |          |           |            |     |        |
| 12      | Guakata      | 1                 |                     |       | 1  |                      |      |          |           |            |     |        |
| 13      | Gurujang     | 3                 |                     |       | 3  |                      |      |          |           |            |     |        |
| 14      | Gurujangpal  | 3                 | 1                   |       | 1  | 1                    |      |          |           |            |     |        |
| 15      | Hatihudi     | 4                 |                     |       | 2  | 1                    |      |          |           |            |     | 1      |
| 16      | Kakudia      | 3                 | 1                   |       | 2  |                      |      |          |           |            |     |        |
| 17      | Kalarangi    | 1                 |                     | 1     |    |                      |      |          |           |            |     |        |
| 18      | Kalarangiata | 6                 |                     |       | 4  |                      |      | 2        |           |            |     |        |
| 19      | Kaliapani    | 18                | 2                   | 2     | 5  | 2                    | 2    | 2        | 2         | 1          |     |        |
| 20      | Kamarda      | 7                 |                     | 2     | 2  |                      |      |          | 2         | 1          |     |        |
| 21      | Kansa        | 8                 | 3                   | 2     | 3  |                      |      |          |           |            |     |        |
| 22      | Katapurti    | 4                 | 1                   |       | 2  | 1                    |      |          |           |            |     |        |
| 23      | Kendubani    | 3                 | 1                   |       | 2  |                      |      |          |           |            |     |        |
| 24      | Kendupura    | 1                 |                     |       |    | 1                    |      |          |           |            |     |        |
| 25      | Koipasi      | 1                 |                     |       | 1  |                      |      |          |           |            |     |        |
| 26      | Kuchilabanka | 2                 |                     |       |    | 2                    |      |          |           |            |     |        |
| 27      | Mahagiri     | 7                 |                     | 3     |    |                      |      |          | 2         | 1          | 1   |        |
| 28      | New kamarda  | 2                 |                     |       | 2  |                      |      |          |           |            |     |        |
| 29      | Ostopal      | 22                |                     | 4     | 13 | 1                    | 1    |          | 2         | 1          |     |        |
| 30      | Patna        | 4                 |                     |       | 4  |                      |      |          |           |            |     |        |
| 31      | Podaora      | 1                 |                     |       | 1  |                      |      |          |           |            |     |        |
| 32      | Ragada       | 7                 | 1                   |       | 5  |                      | 1    |          |           |            |     |        |
| 33      | Raighat      | 2                 | 1                   |       | 1  |                      |      |          |           |            |     |        |
| 34      | Rangamatia   | 4                 | 2                   |       | 2  |                      |      |          |           |            |     |        |
| 35      | Sarubabil    | 16                | 2                   |       | 9  | 2                    |      |          | 2         | 1          |     |        |
| 36      | Sukinda      | 6                 |                     | 1     | 2  |                      |      |          | 2         | 1          |     |        |
| 37      | Sukrunji     | 2                 | 1                   |       | 1  |                      |      |          |           |            |     |        |

| Sl. No. | Village       | Number of Sources | Ground Water Source |           |            | Surface Water Source |          | Mine     |           |            | Spring   |          |
|---------|---------------|-------------------|---------------------|-----------|------------|----------------------|----------|----------|-----------|------------|----------|----------|
|         |               |                   | DW                  | TW/BW     | HP         | River                | Pond     | Mine Pit | ETP Inlet | ETP Outlet |          | WTP      |
| 38      | Talangi       | 7                 |                     |           | 7          |                      |          |          |           |            |          |          |
| 39      | Tungeisuni    | 6                 | 1                   |           | 3          | 1                    | 1        |          |           |            |          |          |
| 40      | Bherubania    | 2                 | 1                   |           |            | 1                    |          |          |           |            |          |          |
| 41      | Dayanabil     | 1                 |                     |           |            | 1                    |          |          |           |            |          |          |
| 42      | Jaypur        | 1                 |                     |           |            | 1                    |          |          |           |            |          |          |
| 43      | Koriapal      | 3                 | 1                   |           | 1          | 1                    |          |          |           |            |          |          |
| 44      | Kuchilabanka  | 1                 |                     |           | 1          |                      |          |          |           |            |          |          |
| 45      | Kusumaguta    | 3                 | 1                   |           | 1          | 1                    |          |          |           |            |          |          |
| 46      | Mathanugaon   | 2                 |                     |           | 1          | 1                    |          |          |           |            |          |          |
| 47      | Nilakanthapur | 1                 |                     |           |            | 1                    |          |          |           |            |          |          |
| 48      | Palaspitha    | 1                 | 1                   |           |            |                      |          |          |           |            |          |          |
| 49      | Purusottampur | 1                 |                     |           |            | 1                    |          |          |           |            |          |          |
|         | <b>Total</b>  | <b>233</b>        | <b>29</b>           | <b>16</b> | <b>131</b> | <b>26</b>            | <b>5</b> | <b>4</b> | <b>12</b> | <b>6</b>   | <b>1</b> | <b>3</b> |

## 4.0 Results and Discussion

The groundwater quality in Sukinda Valley is assessed in accordance with test results of the physico-chemical characteristics and chromium (VI) concentration of analyzed samples and is discussed below.

### 4.1 Physico-Chemical Parameters

All analyzed samples were within the permissible limits for drinking water based on basic parameters such as pH, electrical conductivity, Sulphate, Nitrate, Chloride, Fluoride, and total dissolved solids (TDS). The TDS ranged from 19.6 to 611.1 mg/l, indicating mostly fresh to slightly mineralized water. This suggests limited mineral dissolution under natural aquifer conditions.

Notably, there were no significant water quality changes observed in the post-monsoon in comparison to pre-monsoon periods. Almost all parameters remained static without much significant variation. The minimum, maximum and mean of physico-chemical characteristics of groundwater samples, collected from the study area are presented in the table-2.

**Table-2: Minimum, maximum and mean of Physico-chemical parameters of water samples of the Sukinda Valley area**

| Parameters  | Permissible Limit (BIS, IS 10500:2012) | Maximum | Minimum | Mean  |
|---|--|---------|---------|-------|
| pH  | 6.5-8.5                                | 8.34    | 6.3     | 7.4   |
| Electrical Conductivity $\mu\text{S}/\text{cm}$ at 25°C | ---                                    | 1411    | 32.0    | 283.4 |
| Total Dissolved Solids, mg/l                            | 2000                                   | 611.1   | 19.6    | 151.3 |
| Hardness, as $\text{CaCO}_3$ , mg/l                     | 600                                    | 415.7   | 12.3    | 130.9 |

| Parameters                                    | Permissible Limit (BIS, IS 10500:2012) | Maximum | Minimum | Mean  |
|---|--|---------|---------|-------|
| Total Alkalinity, as CaCO <sub>3</sub> , mg/l | 600                                    | 335.3   | 15.0    | 129.4 |
| Calcium, mg/l                                 | 200                                    | 91.19   | 2.5     | 16.9  |
| Magnesium, mg/l                               | 100                                    | 71.28   | 1.5     | 21.5  |
| Sodium, mg/l                                  | ---                                    | 97.4    | 0.3     | 8.2   |
| Potassium, mg/l                               | ---                                    | 48.3    | 0.1     | 3.0   |
| Carbonate, mg/l                               | ---                                    | 0       | 0.0     | 0.0   |
| Bicarbonate, mg/l                             | ---                                    | 409.1   | 18.3    | 157.9 |
| Chloride, mg/l                                | 1000                                   | 180.5   | 0.8     | 9.6   |
| Sulphate, mg/l                                | 400                                    | 181.2   | 0.1     | 9.3   |
| Nitrate, mg/l                                 | 45                                     | 40.3    | 0.1     | 5.8   |
| Fluoride, mg/l                                | 1.5                                    | 0.55    | 0.0     | 0.1   |

Perusal of the analysis results of the ground water samples show that all the physicochemical parameters are well within the maximum permissible limit for drinking water as per IS 10500:2012.

#### 4.2 Chromium (VI) concentration

Chromium mostly exists in two stable states in nature, i.e. hexavalent chromium Cr(VI) and trivalent chromium Cr(III).

In natural water systems, Cr(III) usually appears as Cr<sup>3+</sup>, Cr(OH)<sup>2+</sup>, Cr(OH)<sub>2</sub><sup>+</sup>, or Cr(OH)<sub>4</sub><sup>-</sup>. It is poorly soluble and tends to precipitate as Cr(OH)<sub>3</sub>, especially at pH values between 6 and 12, limiting its mobility (Rai et al., 1987).

Cr(VI) is more hazardous. It exists in forms like HCrO<sub>4</sub><sup>-</sup>, CrO<sub>4</sub><sup>2-</sup>, and Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup>, depending on pH and redox conditions. Cr(VI) is highly soluble, mobile, and toxic, and although often associated with industries like tanning and electroplating, it can also form naturally via oxidation of Cr(III) by manganese oxides (Godgul & Sahu, 1995). Laboratory experiments confirm that alkaline and oxidizing conditions, which are common in Sukinda's lateritic overburden, favour the conversion of Cr(III) to Cr(VI) (Godgul, 1994; Godgul & Sahu, 1995).

The toxicity and mobility of Cr depends on its speciation. The Cr(III) is mostly immobile; however, Cr(VI) is highly toxic as it is easily soluble and mobile and adversely affect the environment beyond its permissible limit. The permissible limit of Cr(VI) has been set by different organizations for different media viz. soil, drinking water, industrial sewage etc. According to Bureau of Indian standards (BIS) permissible limit of Cr(VI), for drinking water is 0.05 mg/l.

Sukinda Valley receives an annual rainfall of around 1,800 mm, with nearly 80% occurring during the monsoon (June–September). When rainwater interacts with exposed chromite ore, hexavalent chromium [Cr(VI)] can leach into open mine pits. Cr(VI) concentrations in

these mine pits water generally shows value, which is well above the safe limit of 0.05 mg/litre for drinking water set by the BIS.

A total of 233 water samples, collected from various sources during both pre- and post-monsoon seasons, were analyzed for hexavalent chromium [Cr(VI)]. Of these, 39 samples showed Cr(VI) concentrations exceeding 0.05 mg/l in at least one of the seasons. The test results of samples with chromium (VI) above 0.05 mg/l, collected from the Sukinda Valley are given in the Table-3. All the ground water samples collected from dug wells in the area have Cr (VI) concentration below detection limit (BDL).

**Table-3: Location of samples showing concentration of Cr(VI) more than 0.05 mg/l**

| Sl. No. | District | Block    | Village                 | Source    | Longitude | Latitude | Concentration of Cr(VI) in mg/l |              |
|---------|----------|----------|-------------------------|-----------|-----------|----------|---------------------------------|--------------|
|         |          |          |                         |           |           |          | Pre-monsoon                     | Post-Monsoon |
| 1       | Jajpur   | Sukinda  | Kamarda Mines Inlet     | ETP Inlet | 85.82639  | 21.06333 | 0.079                           | 0.1247       |
| 2       | Jajpur   | Danagadi | Mahagiri Inlet          | ETP Inlet | 85.77588  | 21.03115 | 0.1022                          | 0.111        |
| 3       | Jajpur   | Sukinda  | Ostopal Inlet           | ETP Inlet | 85.79042  | 21.05996 | 1.861                           | 0.7217       |
| 4       | Jajpur   | Sukinda  | S. Kaliapani mine Inlet | ETP Inlet | 85.77843  | 21.04663 | 0.601                           | 0.3058       |
| 5       | Jajpur   | Sukinda  | Saruabil Inlet          | ETP Inlet | 85.82075  | 21.05867 | 0.875                           | 0.4608       |
| 6       | Jajpur   | Sukinda  | Sukinda Mine TATA Inlet | ETP Inlet | 85.74322  | 21.02156 | 0.91                            | 0.7915       |
| 7       | Jajpur   | Sukinda  | Balipada 3              | HP        | 85.83184  | 21.06969 | 0.0705                          | 0.0601       |
| 8       | Jajpur   | Sukinda  | Balipada 4              | HP        | 85.82621  | 21.06893 | 0.2921                          | 0.0456       |
| 9       | Jajpur   | Sukinda  | Balipada 5              | HP        | 85.82558  | 21.06732 | 0.0809                          | 0.0601       |
| 10      | Jajpur   | Sukinda  | Balipada 6              | HP        | 85.82574  | 21.06763 | 0.133                           | 0.1194       |
| 11      | Jajpur   | Sukinda  | Balipura Village        | HP        | 85.83441  | 21.06996 | 0.0734                          | 0.0553       |
| 12      | Jajpur   | Sukinda  | Bhingtangar             | HP        | 85.73725  | 21.01972 | 0.139                           | 0.1522       |
| 13      | Jajpur   | Sukinda  | Bhingtangar 4           | HP        | 85.73688  | 21.01974 | 0.0445                          | 0.094        |
| 14      | Jajpur   | Sukinda  | Bhingtangar 5           | HP        | 85.73718  | 21.0206  | 0.0423                          | 0.1404       |
| 15      | Jajpur   | Sukinda  | Bhingtangar 1           | HP        | 85.73825  | 21.01975 | 0.1568                          | 0.0116       |
| 16      | Jajpur   | Sukinda  | Bhingtangar 2           | HP        | 85.73582  | 21.01974 | 0.085                           | 0.0648       |
| 17      | Jajpur   | Sukinda  | Bhingtangar 3           | HP        | 85.73535  | 21.02021 | 0.094                           | 0.0648       |
| 18      | Jajpur   | Sukinda  | Bhingtangar 6           | HP        | 85.73656  | 21.02009 | 0.0804                          | 0.0744       |
| 19      | Jajpur   | Sukinda  | Bhingtangar 7           | HP        | 85.73656  | 21.02009 | 0.0862                          | 0.0812       |
| 20      | Jajpur   | Sukinda  | Bhingtangar 8           | HP        | 85.73578  | 21.02001 | 0.112                           | 0.0841       |
| 21      | Jajpur   | Sukinda  | Kamarda                 | HP        | 85.83567  | 21.06035 | 0.1551                          | 0.1404       |
| 22      | Jajpur   | Sukinda  | New kamarda             | HP        | 85.83798  | 21.0612  | 0.0815                          | 0.0965       |
| 23      | Jajpur   | Sukinda  | Ostopal                 | HP        | 85.79572  | 21.06553 | 0.688                           | 0.6715       |
| 24      | Jajpur   | Sukinda  | Ostopal 2               | HP        | 85.7876   | 21.0579  | 0.3545                          | 0.3122       |
| 25      | Jajpur   | Sukinda  | Ostopal 3               | HP        | 85.80096  | 21.06154 | 0.3546                          | 0.2765       |
| 26      | Jajpur   | Sukinda  | Patna 2                 | HP        | 85.7695   | 21.06582 | 0.4105                          | 0.3993       |
| 27      | Jajpur   | Sukinda  | Saruabil                | HP        | 85.81069  | 21.05721 | 0.1365                          | 0.0482       |
| 28      | Jajpur   | Sukinda  | Saruabil                | HP        | 85.81056  | 21.05806 | 0.0962                          | 0.0466       |
| 29      | Jajpur   | Sukinda  | Kalarangiatta Mine Pit  | Mine Pit  | 85.74167  | 21.01892 | 0.6037                          | 0.59         |
| 30      | Jajpur   | Sukinda  | S Kaliapani Quarry F    | Mine Pit  | 85.79981  | 21.0412  | 0.6543                          | 0.6205       |

| Sl. No. | District  | Block       | Village      | Source       | Longitude | Latitude | Concentration of Cr(VI) in mg/l |              |
|---------|-----------|-------------|--------------|--------------|-----------|----------|---------------------------------|--------------|
|         |           |             |              |              |           |          | Pre-monsoon                     | Post-Monsoon |
| 31      | Jajpur    | Sukinda     | Chingudipal  | Damsala Nala | 85.77329  | 21.05104 | 0.7313                          | 0.0417       |
| 32      | Jajpur    | Sukinda     | Chirgunia    | Damsala Nala | 85.75855  | 21.0434  | 0.09                            | 0.0302       |
| 33      | Jajpur    | Sukinda     | Ghagiasahi   | Damsala Nala | 85.74094  | 21.03551 | 0.067                           | 0.19         |
| 34      | Jajpur    | Sukinda     | Kallapani    | Damsala Nala | 85.77226  | 21.04578 | 0.1984                          | 0.032        |
| 35      | Jajpur    | Sukinda     | Kaliapani    | Damsala Nala | 85.77229  | 21.04584 | 0.1986                          | 0.0374       |
| 36      | Jajpur    | Sukinda     | Katapurti    | Damsala Nala | 85.73861  | 21.03059 | 0.4502                          | 0.035        |
| 37      | Dhenkanal | Kankadahada | Kuchilabanka | Damsala Nala | 85.72455  | 21.01722 | 0.06                            | 0.0703       |
| 38      | Dhenkanal | Kankadahada | Kusumaguta   | Damsala Nala | 85.72075  | 21.00532 | 0.12                            | 0.0383       |
| 39      | Jajpur    | Sukinda     | Oastapal     | Damsala Nala | 85.7841   | 21.05401 | 0.0884                          | 0.0442       |

Out of 183 samples collected during pre-monsoon period from different sources, 37 samples have Cr (VI) concentration more than 0.05 mg/l. Out of these 37 samples having Cr (VI) above permissible limit (>0.05 mg/litre), 20 are from hand pumps (HPs), 6 are from effluent treatment plant (ETP) inlets, 2 are from mine pits and 9 are from Damsala river. Similarly out of 50 samples collected from different sources during post-monsoon period, 28 samples have Cr (VI) concentration more than 0.05 mg/l. Out of these 28 samples having Cr (VI) above permissible limit (>0.05 mg/litre), 18 number are from hand pumps (HPs), 6 number are from ETP inlets, 2 number are from mine pits and 2 number are from Damsala river. The samples collected from surface water source (Damsala river) show concentration of Cr (VI) > 0.05 mg/l during pre-monsoon season, whereas the concentration in most of the samples is within the permissible limit during post-monsoon season.

**Table-4: Source wise samples analysed vs samples with Cr(VI)>0.05 mg/l**

| Sl. No. | Source       | Pre-monsoon             |                               | Post-monsoon            |                               |
|---------|--------------|-------------------------|-------------------------------|-------------------------|-------------------------------|
|         |              | No. of Samples Analysed | Samples with Cr(VI)>0.05 mg/l | No. of Samples Analysed | Samples with Cr(VI)>0.05 mg/l |
| 1       | DW           | 28                      | 0                             | 1                       | 0                             |
| 2       | BW           | 11                      | 0                             | 5                       | 0                             |
| 3       | HP           | 99                      | 20                            | 31                      | 18                            |
| 4       | Damsala Nala | 23                      | 9                             | 4                       | 2                             |
| 5       | Mine pit     | 2                       | 2                             | 2                       | 2                             |
| 6       | Pond         | 5                       | 0                             | 0                       | 0                             |
| 7       | ETP-Inlet    | 6                       | 6                             | 6                       | 6                             |
| 8       | ETP-outlet   | 6                       | 0                             | 0                       | 0                             |
| 9       | WTP          | 1                       | 0                             | 0                       | 0                             |
| 10      | Spring       | 2                       | 0                             | 1                       | 0                             |
|         | <b>Total</b> | <b>183</b>              | <b>37</b>                     | <b>50</b>               | <b>28</b>                     |

The water collected in the mine pits through rainfall and seepage of ground water is pumped out for facilitation of mining activities. These pumped water have been treated in ETPs of different mining companies before release in the Damsala Nala. The Cr (VI) concentration in water samples collected from the outlets of these ETPs is below detection limit (BDL).

The Damsala Nala, the stream draining the valley, receives treated effluent from the Effluent Treatment Plants (ETPs) and is frequently used by local villagers for purposes other than drinking like bathing and recreational activities. Water samples were collected from various locations during the study period revealed that chromium concentration was exceeding 0.05mg/l in many places there by exceeding the Bureau of Indian Standards acceptable limit (0.05mg/l). However, elevated chromium concentrations exceeding 0.05 mg/l in Damsala Nala are restricted to its stretch within the Sukinda Valley area. Beyond the valley, both at upstream and downstream, the concentration does not exceed the permissible limit. The samples collected from Bramhani River downstream the valley area show total Chromium concentration below detection limit (BDL).

At most monitoring sites, chromium levels in groundwater remained relatively stable across both daily and seasonal timescales. In locations where consecutive-day sampling was carried out, no significant variations were detected. Overall, the fluctuations observed were minimal. This consistent pattern in chromium concentration suggests the presence of a steady, naturally occurring (geogenic) source.

Chromium (VI) contamination was absent in shallow, unconfined (phreatic) aquifers, indicating that the phreatic zone remain relatively free from contaminations. This suggests that deeper semi-confined aquifers in the area are more vulnerable due to longer residence time and deeper oxidation mechanisms.

## 5.0 Conclusion and Recommendations

The Sukinda Valley area has phreatic aquifer up to a depth of 30 meter below ground level followed by fractured deeper aquifer. A total number of 233 samples were collected from the study area and analysed. The samples were collected from hand pumps, dug wells, Effluent Treatment Plant (ETP) mine pits, Damsala Nala and Brahmani River. In addition to these groundwater samples, samples were also collected from surface water body (pond, spring and river), to assess the quality. Out of 233 samples, 37 samples have shown higher concentration of chromium (VI) above 0.05 mg/l during pre-monsoon and 28 locations have shown chromium (VI) above 0.05 mg/l during post-monsoon season.

The findings and recommendations to prevent the ground water contaminations in the area are as follows.

1. The upper phreatic aquifer (up to 30 mbgl) is free from Cr (VI) contamination, this zone may be tapped for drinking and domestic water supply purpose after ensuring quality of every individual source.

2. While the shallow phreatic aquifers are free from chromium contamination, determining the precise extent of contamination in the deeper aquifers remains challenging. Wells drilled to similar depths in close proximity exhibiting vastly different levels of Cr(VI) results in an unpredictable spatial pattern. This variability, coupled with the absence of consistent anthropogenic sources, suggests that the natural oxidative mobilization of Cr(VI) from chromite-bearing strata is the primary mechanism driving the contamination and is suggestive of the geogenic origin.
3. It is essential to expand and strengthen the safe drinking water supply schemes to ensure the provision of safe water to the local population.
4. Contaminated wells should be permanently closed to prevent public exposure to unsafe water sources.
5. If new wells are constructed, they must be subject to periodic water quality monitoring to ensure the safe quality of the water.
6. The Cr (VI) concentration in water samples collected from the outlets of the ETPs of different mining companies is below detection limit (BDL).
7. Effluent treatment systems in the mining areas must be strictly maintained to ensure effective treatment and compliance with discharge standards. This is crucial to prevent contamination of nearby surface water bodies.
8. Elevated chromium concentrations exceeding 0.05 mg/l in Damsala Nala are restricted to its stretch within the Sukinda Valley area. Beyond the valley, both at upstream and downstream, the concentration of Cr (VI) does not exceed the permissible limit. Samples collected from Bramhani River downstream the Sukinda Valley area show Chromium concentration below detection limit (BDL).
9. Ultramafic, chromite-rich regions like the Sukinda Valley require rigorous and continuous water quality management to mitigate environmental degradation and associated public health risks.



Plate-1: Location map of Sukinda valley, District-Jajpur, Odisha

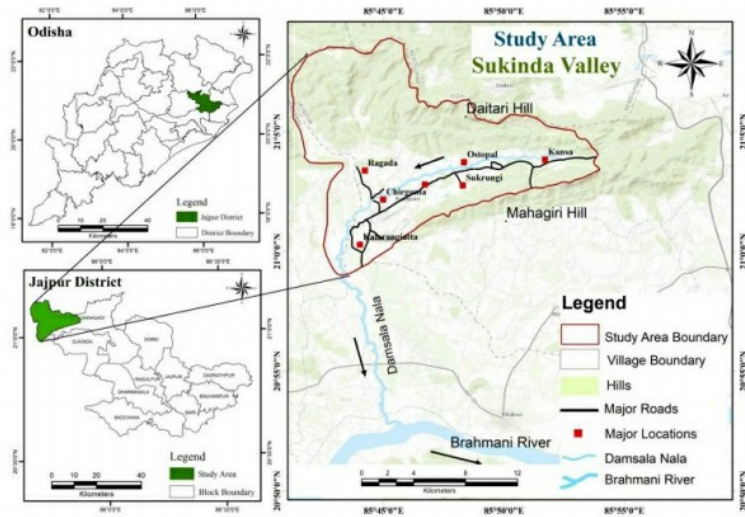


Plate-2: Depth to water level map (Pre-monsoon, 2024) of phreatic aquifer of Sukinda Valley, District-Jajpur, Odisha

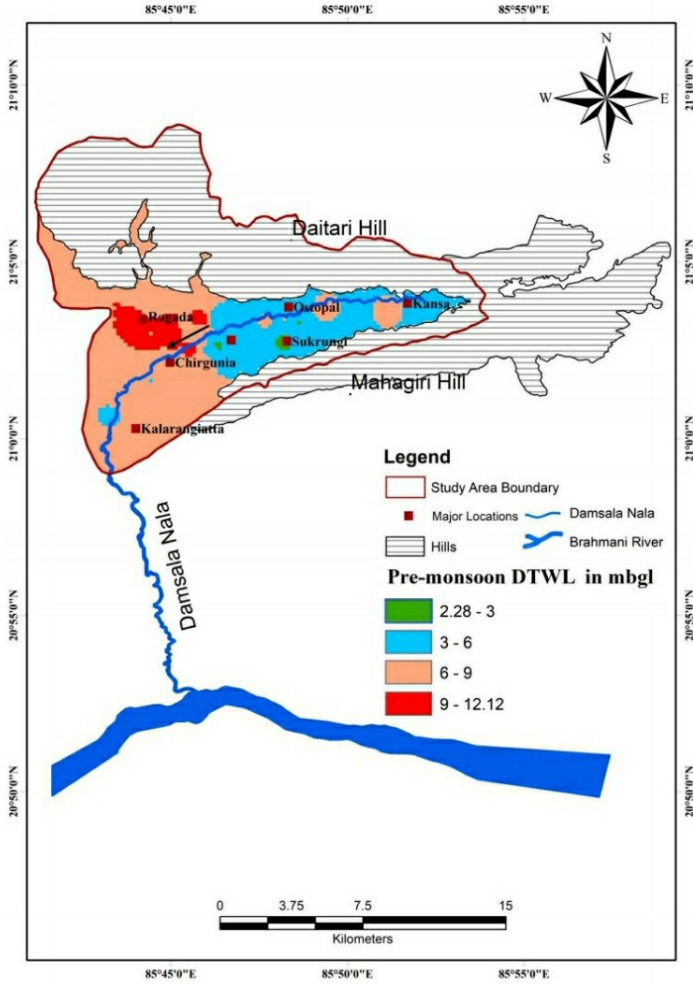


Plate-3: Depth to water level map (Post-monsoon, 2024) of phreatic aquifer of Sukinda Valley, District-Jajpur, Odisha

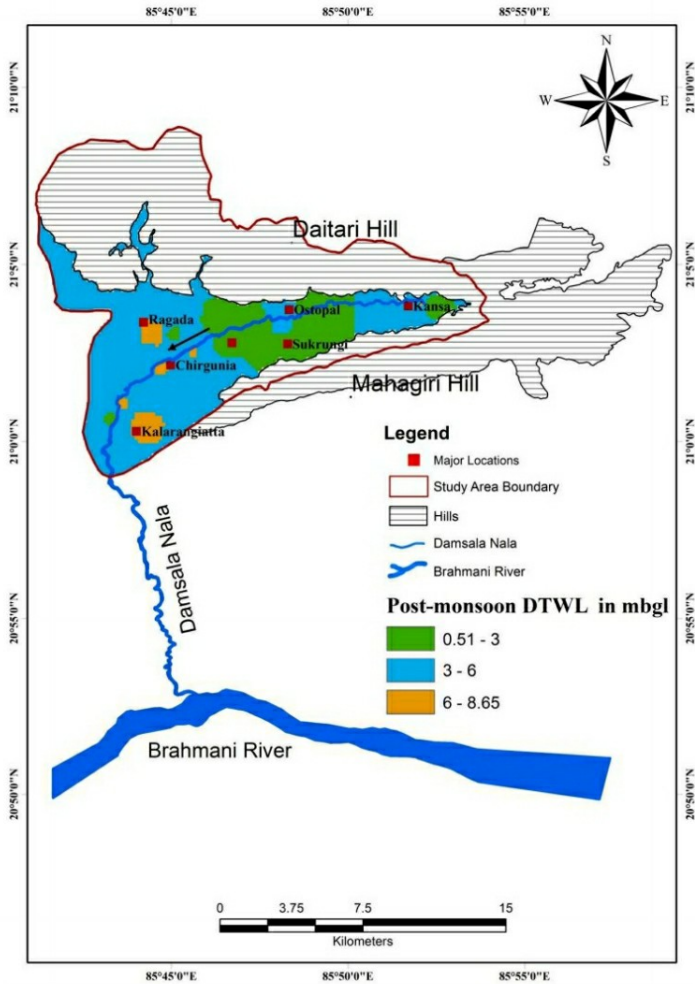


Plate-4: Depth to water level map (Pre-monsoon, 2024) of deeper aquifer of Sukinda Valley, District-Jajpur, Odisha

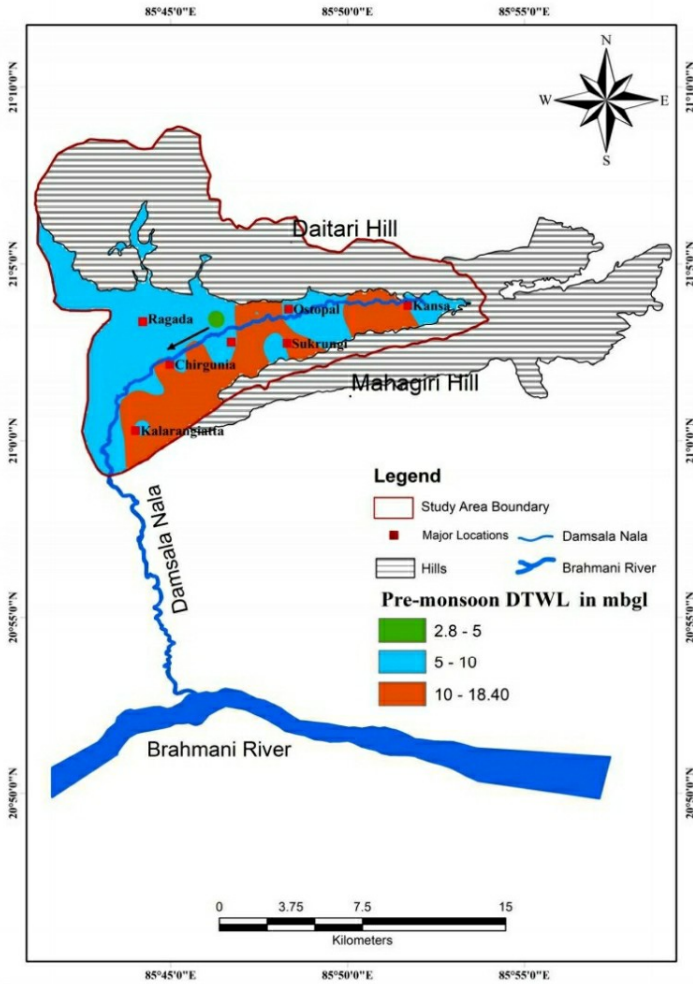


Plate-5: Depth to water level map (Post-monsoon, 2024) of deeper aquifer of Sukinda Valley, District-Jajpur, Odisha

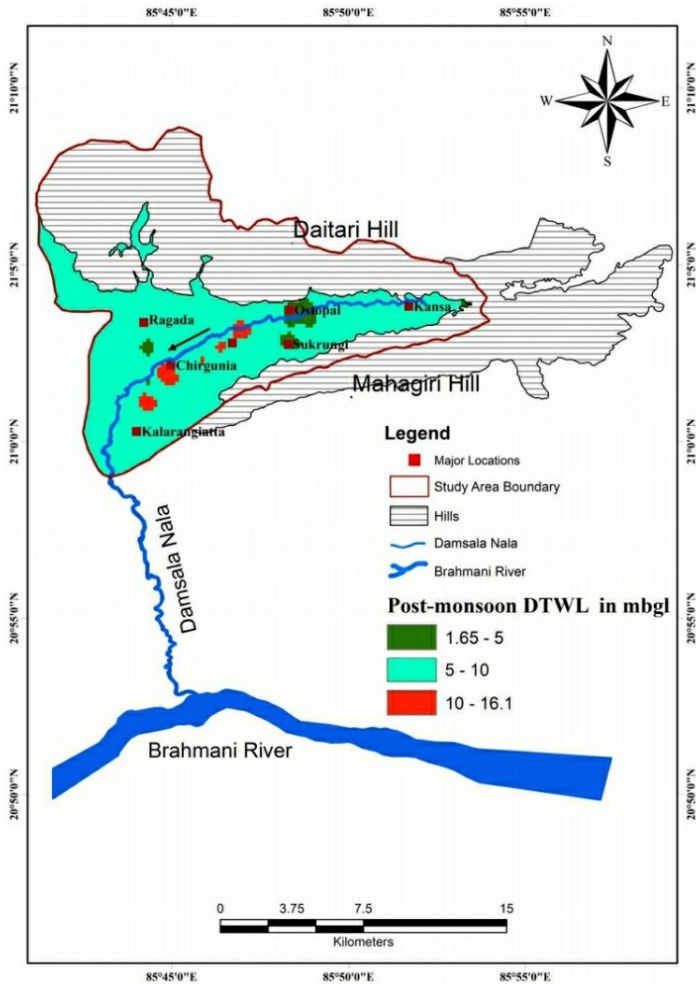


Plate-6: Hydrogeological map of Sukinda Valley, District-Jajpur, Odisha

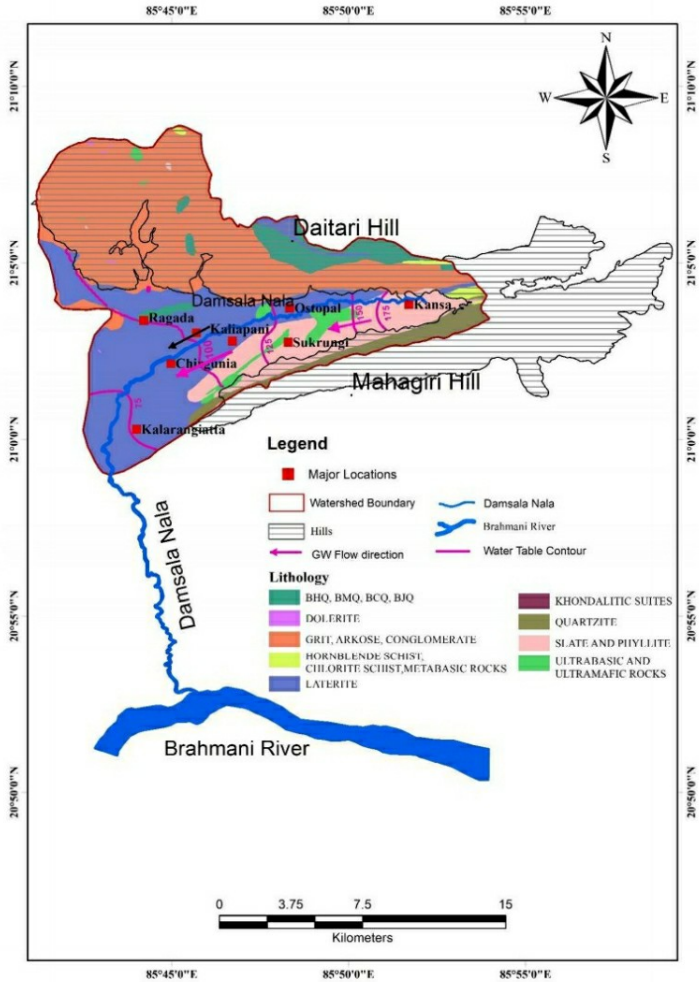


Plate-7: Sample location map of Sukinda Valley, District-Jajpur, Odisha

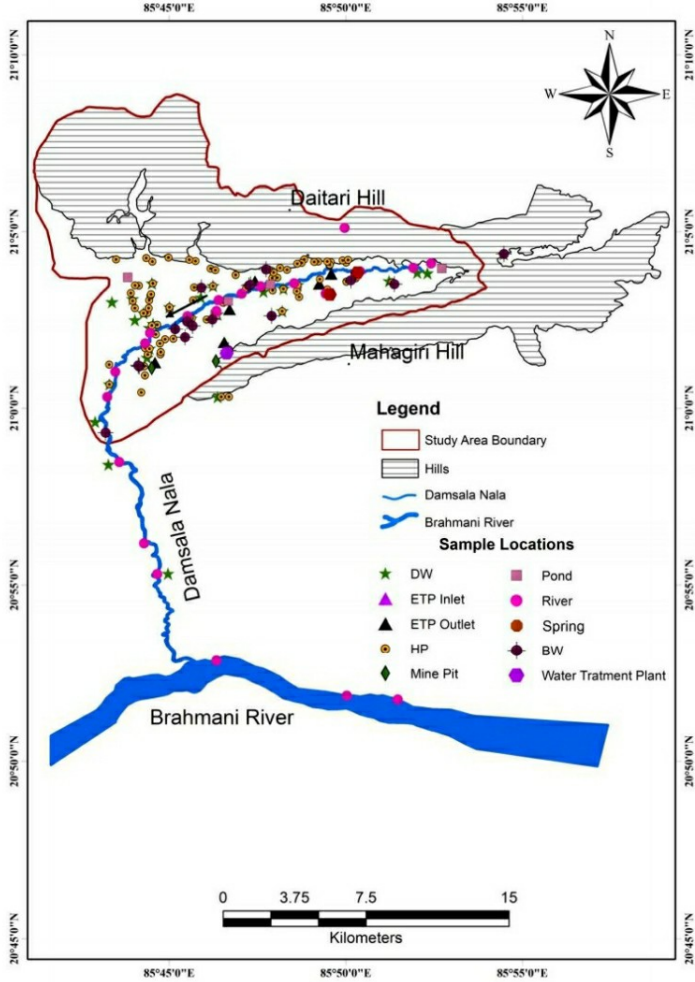
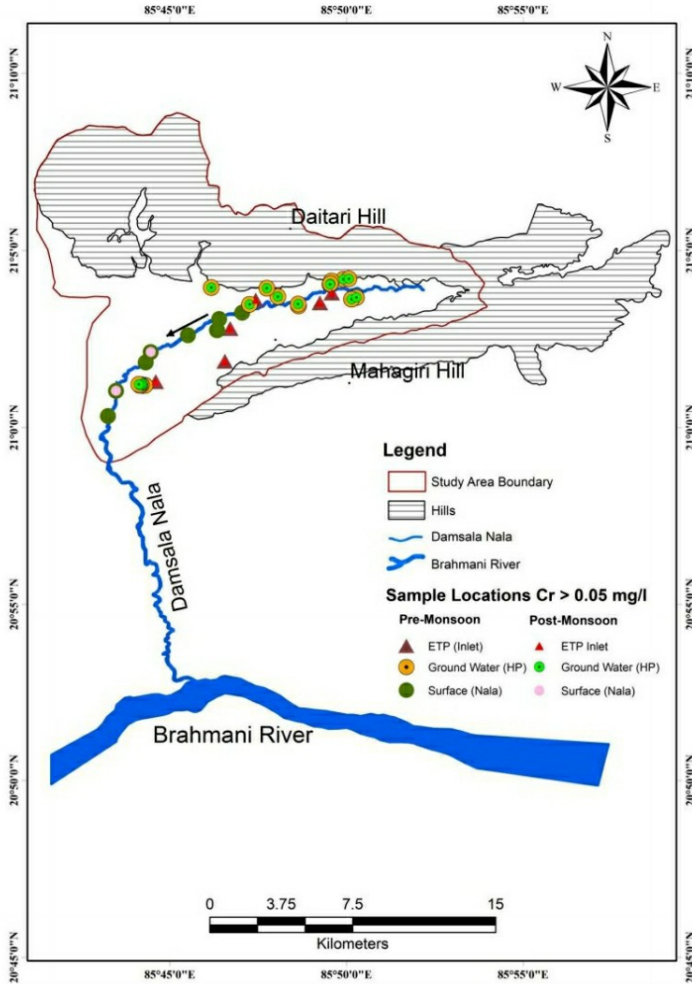


Plate-8: Spatial distribution of samples with Chromium (VI) above permissible limit



**VAKALATNAMA**  
**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, EASTERN**  
**ZONE BENCH, KOLKATA**

Original Application No.- of 2026

In re:

**Kailash Chandra Nayak**

**APPLICANT**

Versus

**State Of Odisha & Ors**

... **RESPONDENTS**

KNOW ALL to whom these present shall come I, Kailash Chandra Nayak, C/o- Chakradhar Nayak, aged about- 48 years, At/Po- Nuadihi, Dist- Jajpur, Pin- 755018. Applicant in the above mentioned matter, do hereby appoint (herein after called the advocate/s) to be my/our Advocate in the above noted case authorized him :-**Sankar Prasad Pani**, Advocates, Plot No 2132/4814 B, Nageswartangi, Bhubaneswar, 751002, Mob-no.9437279278, Email- [sankarprasadpani@gmail.com](mailto:sankarprasadpani@gmail.com) Enrollment no. O-785/07 and **Ashutosh Padhy**, Enrollment no. O-1018/23.

To act, appear and plead in the above-noted case in this Court or in any other Court in which the same may be tried or heard and also in the appellate Court including High Court subject to payment of fees separately for each Court by me/ us. To sign, file verify and present pleadings, appeals cross objections or petitions for execution review, revision, withdrawal, compromise or other petitions or affidavits or other documents as may be deemed necessary or proper for the prosecution of the said case in all its stages. To file and take back documents to admit and/or deny the documents of opposite party.

To withdraw or compromise the said case or submit to arbitration any differences or disputes that may arise touching or in any manner relating to the said case. To take execution proceedings. The deposit, draw and receive money, cheques, cash and grant receipts thereof and to do all other acts and things which may be necessary to be done for the progress and in the course of the prosecution of the said case. To appoint and instruct any other Legal Practioner, authorizing him to exercise the power and authority hereby conferred upon the Advocate whenever he may think it to do so and to sign the Power of Attorney on our behalf.

And I/We the undersigned do hereby agree to ratify and confirm all acts done by the Advocate or his substitute in the matter as my/our own acts, as if done by me/us to all intents and purposes.

And I/We undertake that I / we or my /our duly authorized agent would appear in the Court on all hearings and will inform the Advocates for appearance when the case is called.

And I /we undersigned do hereby agree not to hold the advocate or his substitute responsible for the result of the said case. The adjournment costs whenever ordered by the Court shall be of the Advocate, which he shall receive and retain himself.

And I /we the undersigned do hereby agree that in the event of the whole or part of the fee agreed by me/us to be paid to the Advocate remaining unpaid he shall be entitled to withdraw from the prosecution of the said case until the same is paid up. The fee settled is only for the above case and above Court. I/We hereby agree that once the fee is paid. I /we will not be entitled for the refund of the same in any case whatsoever. If the case lasts for more than three years, the advocate shall be entitled for additional fee equivalent to half of the agreed fee for every addition three years or part thereof.

IN WITNESS WHEREOF I/We do hereunto set my /our hand to these presents the contents of which have been understood by me/us on this 4th day of April 2026.

Accepted subject to the terms of fees.

  
Advocate

  
Client