



OCM/ENV/ 870 /2018

Date: 26.11.2018

To

Dr. A.K. Gupta  
Joint Director(S)  
Ministry of Environment, Forest & Climate change  
Govt. of India  
Eastern Regional Office  
Bhubaneswar

Sub: Six monthly compliance of conditions stipulated vide Environmental Clearance Letter No.J-11015/38/2006-IA.II(M), dtd. 06-12-2006 for Ostapal Chromite Mines of M/s. FACOR Ltd.

Dear Sir,

With reference to above stated Environmental Clearance letter, we are herewith submitting hard copies of six monthly compliance report of our Ostapal Chromite Mines of M/s. FACOR Ltd. for the period from April, 2018 to September, 2018 for your kind perusal. The soft copy of the same has already been mailed to your good office.

Thanking you,

Yours faithfully,  
for FERRO ALLOYS CORPORATION LTD.

  
MINES MANAGER

Encl: As above

Copy to: The Director, MOEF, New Delhi – for favour of kind information.

Name of the Project : **OSTAPAL CHROMITE MINES, M/S. FACOR LTD.**  
Project Code : Mining (Non-Coal)  
Clearance Letter No. with date : No. J-11015/183/2007-IA-II (M) dt.13-05-09  
Period of Compliance Report : April, 2018 to September, 2018

**Specific Condition:**

Sl. No.	Condition	Compliance Status
1.	All the conditions stipulated by the State Pollution control Board, in their Consent to establish should be effectively implemented.	All the stipulated conditions are being effectively implemented.
2.	Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 4.07 ha forest land shall be obtained before starting mining operation in that area. Till such time mining activities shall be restricted to an area of 64.354 ha for which in principle forestry clearance has been obtained from the Ministry on 03.10.2005	This area is left as Safety Zone area for greenbelt around periphery of forest land of M.L. area and mining operations in this area will not be done.
3.	Top soil should be stacked properly with proper slope at earmarked site(s) with adequate measures and should be used for reclamation and rehabilitation of mined out area.	No top soil has been generated during the period April, 2018 to September, 2018.
4.	Over burden shall be stacked at earmarked dump site(s) only and should not be kept active for long period. The total height of the dump(s) should not exceed 45m in three stages of 15 m each, keeping overall slope of the dumps below 28°. The proponent shall carry out slope stability study and submit report to the Ministry. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be taken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.	The OB is being dumped at earmarked sites only. The OB dump is not kept active for long period. The present height of the dump is 41m with overall slope 25°. In future also the overall slope will be maintained below 28 degrees. The inactive benches are being vegetated by suitable native species and massive grass plantation to prevent erosion & surface runoff. The management of the rehabilitated areas of the dumps has been continuing until the vegetation becomes self sustaining.
5.	Trace Metals such as Ni, Co, As, and Hg should be analyzed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards then with prior approval of MOEF this specific monitoring could be discontinued.	Collection and analysis of dust & soil samples is done and the test reports are enclosed in <b>Annexure-1</b> . There is no standards for Ni, Co, As and Hg for dust fall and soil samples.

6.	<p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, plantation etc. The drains should be regularly de-silted and maintained properly.</p> <p>Garland drain (size, gradient and length) shall be constructed for both mine pit &amp; waste dump and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.</p> <p>Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall / super cyclone period. A separate storm water sump for this purpose should be created.</p>	<p>Catch drains around OB dumps and mineral stockyard have already been constructed with siltation ponds at regular intervals to arrest silt and sediments. Whenever required the silts and sediments are being cleaned from catch drains and siltation ponds and maintained regularly. Mine pumped out water is sufficient for dust suppression and plantation purposes. Hence catch drain water is discharging outside ML area through upgraded ETP. Hence there is no need for collection of water from catch drains from mine area, roads, plantation etc.</p> <p>Garland drains of width 2m, depth 1.5m and length 4325 m with gradient have been constructed for maximum discharge of rainfall in the adjoining areas.</p> <p>There is no chance of flow of storm water into the effluent treatment plant during high rain fall/super cyclone period because the plant is at high reduced level (RL). Hence storm water return system is not required.</p>
7.	<p>Dimensions of retaining wall at the toe of OB dumps &amp; benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>Retaining wall of width 1.5m and height 1.2m has already been constructed all around the toe of dumps upto a length of 3020 m to check the run-off and siltation.</p>
8.	<p>Effluents containing of Cr<sup>+6</sup> shall be treated to meet the prescribed standards before reuse/discharge. Effluent Treatment plant should be provided for treatment of mine water discharge and wastewater generated from the workshop and mineral separation plant.</p> <p>Run off from OB dumps and other surface run off should be analyzed for Cr<sup>+6</sup> and in case its concentration is found higher than the permissible limit the water should be treated before reuse/discharge.</p>	<p>An Effluent Treatment Plant isoperating for treatment of Mines discharge water. The conc. of Cr<sup>+6</sup> in treated discharge water is &lt;0.005 mg/l. The tailing water (waste water of mineral separation plant) also is being treated by adding FeSO<sub>4</sub> before discharge into tailing pond. The treated tailing pond water is being collected in an intake pond and being re-used in beneficiation plant. Thus zero discharge from Beneficiation Plant is being maintained.</p> <p>Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few nos. of vehicles. The major repairing of these vehicles is being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil.</p> <p>The total surface runoff water is being collected in two settling pits which are pumped to the ETP for treatment before final discharge.</p>
9.	<p>Separate impervious concrete pits for disposal of sludge shall be provided for the safe disposal of sludge generated from the</p>	<p>The sludge generated from mining operations contains chrome ore. It is being fed in Beneficiation Plant to separate the Chrome.</p>

	mining operations.	
10.	The Project proponent shall ensure that the quality of decanted effluents from the tailing pond conform to the prescribed standards before discharge.	The effluents from tailing pond are not discharged outside. The supernatant water of the tailing pond is being collected in a sump adjacent to the tailing pond and re-circulated in Beneficiation Plant.
11.	The Project proponent shall explore the possibility to reduce concentration of Cr <sup>+6</sup> in the tailing pond in consultation with an Expert Scientific Institution like NEERI.	The Conc. of Cr <sup>+6</sup> in tailings is being reduced by adding FeSO <sub>4</sub> solution and disposed in the tailing pond.
12.	Plantation shall be raised in an area of 33.02 Ha including green belt in an area of 6.56 Ha by planting native species around ML area, OB dumps, and roads around worked out area etc. in consultation with local DFO/Agriculture Department. The density of the trees should be around 2000 plant species per hectare.	Plantation has been done over inactive benches of OB dumps, Road side, around C.O.B Plant and inside the colony in an area of 36.07 Ha. Plantation is being carried out in consultation with local Forest Department.
13.	Regular monitoring of ground water level & quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground Water Board.	Monitoring of ground water level & quality is being carried out in 6 Nos. of existing wells (2 Nos. bore wells in Core Zone & 2 Nos. open wells & 2 Nos. of tube well in Buffer Zone.) and 3 Nos. of piezometer holes inside the Mine. The monitoring report for the period from April, 2018 to September, 2018 is enclosed as <b>Annexure-2 &amp; 2A.</b>
14.	The project proponent shall carry out regular monitoring of ground water quality in all the 14 wells. The frequency of monitoring in 8 wells where concentration of Cr <sup>+6</sup> is within permissible limits, will be quarterly while in the remaining 6 wells it will be on monthly basis.	The monitoring test reports of ground water quality in 6 Bore wells & 3 Nos. of piezometer holes are enclosed as <b>Annexure-3.</b>
15.	Project Authorities should meet water requirement of the peripheral village(s), especially, if the village wells go dry due to mine de-watering.	As a part of peripheral development the Project Authority has constructed Bore wells at nearby villages and also potable water is being provided to nearby villages by water tankers.
16.	Permission from the competent authority should be obtained for drawal of ground water for domestic use.	NOC has been obtained from Central Ground Water Authority, Ministry of Water Resources, New Delhi vide letter no.21-4/1456/OR/MIN/2017-1735 dated 28.08.2018 for ground water withdrawal.
17.	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, CGWB.	Rain water has been collected in different pits for suitable rain water harvesting measures.

18.	Drills should be wet operated or operated with dust extractors.	Drilling operation is being carried out with dust extractors.
19.	Blasting operation should be carried out only during the day time. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting operation is being carried out in day time only. Controlled blasting is being practiced by following Nonel & muffle blasting. Delay detonators are used for providing delay timings between rows and within rows of holes. Numbers of rows in a blast are restricted to less than three to get good fragmentation and to reduce flyrocks and ground vibration.
20.	The voids created at the end of mining shall be converted into water Body with shallow depths not exceeding 30m. The higher benches of the excavated void/mine pit shall be terraced and plantation done to stabilize the slopes. Peripheral fencing shall be done along the excavated area.	The same will be implemented at the end of mining operation.
21.	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be over loaded.	Vehicular emission of all machinery used in mining operations are being monitored regularly and kept under control of rigorous maintenance of all engines and changing of lubricants as per the recommendation of the manufacturer. HEMMs have valid PUC Certificate which is only allowed for operation inside the Mines. All the transporting vehicles are being covered with tarpaulin and over loading are strictly avoided.
22.	Consent to operate should be obtained from SPCB before enhancing Production capacity of the mine.	Consent to operate has been obtained from SPCB, Bhubaneswar .There is no proposal of enhancing the production capacity of the mine.
23.	Sewage treatment Plant should be installed for the colony. ETP should also be provided for workshop and waste water generated from Mining operations.	There is no colony inside the ML area. Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. of vehicles. However, major repairing of the vehicles is being done at outside workshop and minor repairing is being done in our garage. Hence, discharge of workshop effluent is nil. An ETP has already been established for treatment of mines water.
24.	A final mines closure plan along with details of corpus fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	The same will be submitted in due time to MOEF for approval.

**GENERAL CONDITIONS:**

Sl. No.	Condition	Compliance Status
1	No change in mining technology & scope of working should be made without prior approval of the Ministry of Environment & Forests.	The Mining technology & scope of working has not been changed.
2	No change in the calendar plan including excavation, quantum of mineral Chromite and waste should be made.	The calendar plan including excavation, quantum of mineral Chromite and waste over burden has not been changed. The calendar plan including excavation, quantum of mineral chromite and waste over burden has been generated during the period (April, 2017 to March, 2018) is given in <b>Annexure-4</b> .
3	Conservation measures for protection of flora & fauna in the Core & Buffer Zone should be drawn up in consultation with local forest & wild life department.	As per the advice of Forest Department, we are maintaining vehicles, watchman and infrastructural facility as measures to protect Flora & Fauna in core & buffer zone.
4	Four ambient air quality-monitoring stations should be established in the Core zone as well as in the Buffer zone for RPM, SPM, SO <sub>2</sub> & 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 in consultation with the State Pollution Control Board.	Ambient Air quality monitoring stations has already been established in consultation with SPCB.
5	Data on ambient Air Quality (RPM, SPM, SO <sub>2</sub> & NO <sub>x</sub> ) should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.	Test reports on Ambient Air Quality monitoring viz., PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> & CO for the period April, 2018 to September, 2018 is enclosed as <b>Annexure-5</b> .
6	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading & unloading and at transfer points should be provided and properly maintained.	Control of fugitive dust emissions is being carried out by water spraying on haul roads, Ore handling yard, loading and unloading points regularly. The test report of the same is enclosed as <b>Annexure-6</b> .
7	Measures should be taken for control of noise levels below 85 dB (A) in work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	Control measures such as maintenance of all machines including checking of silencers regularly, controlled blasting using delay detonators, installing immovable machinery on foundations with suitable rubber pad and closed rooms is being followed-up. The workers engaged at noise generating areas are allowed to work on rotation basis with providing ear plugs/muffs.

		<p>The present noise level of work environment is below 68 dB (A).</p> <p>Location wise noise level at work environment is enclosed as <b>Annexure-7</b>.</p>
8	<p>Industrial waste water (workshop &amp; waste water from the Mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19<sup>th</sup> May, 1993 and 31<sup>st</sup> December, 1993 or as amended from time to time. Oil &amp; grease trap should be installed before discharge of workshop effluents.</p>	<p>The Mines waste water is being pumped out directly in to the intake tank of the ETP for treatment of Cr<sup>+6</sup> and part of the treated water is used in our COB Plant, plantation, dust suppression and surplus treated water is finally discharged to outside ML area. The analysis of this water shows that all parameters are well within the prescribed limit. The analysis report of Mines final discharge water after treatment in E.T.P., for the period April, 2018 to September, 2018 is enclosed as <b>Annexure-8</b>. Almost all mining machineries and transporting vehicles are being engaged on contract basis for transportation of OB and chrome ore. The company has few Nos. of vehicles. The major repairing of these vehicles is being done outside mines and minor repairing is being done in our garage. Hence, discharge of workshop effluent is not envisaged.</p>
9	<p>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.</p> <p>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.</p>	<p>In addition to water spraying to suppress dust generation, workers engaged in dusty areas such as drillers, dumper drivers, HEMM Operators are being provided with nose masks as precautionary measure.</p> <p>Training &amp; information on safety, health hazards are being given to all categories of deserved workers. Occupational health surveillance programme to all categories of workers and employees is being conducted periodically by lung function test, audiometry test, vision tests and other tests. Workers/employees with defects are advised for suitable treatment or engaged on suitable rotation duty.</p>
10	<p>A separate Environment 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.</p>	<p>A separate Environment Management Cell with qualified personnel and well equipped Environment Engineering Laboratory is functioning under the control of a Senior Executive.</p> <p>Besides we are carrying out all Environmental monitoring &amp; analysis through a MoEF &amp; NABL accredited laboratory M/S Environmental Research and Services (India) Pvt. Ltd., Bhubaneswar &amp; the monitoring reports are enclosed in Annexures.</p>
11	<p>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.</p>	<p>The final approval of the Project is 06.12.2006. It is a mining industry. Hence, land development work is a continuous process.</p>

12	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.	Separate funds provision is made to carryout environmental protection measures. Details of expenses during the year 2017-18 and proposed budgeted amount for the year 2018-19 are given in <b>Annexure-9</b> .
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**ANALYSIS REPORT of DUST FALL  
(For May-2018)**

**Date: 12 June 2018**

Name and Address of the Customer: Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 02-31.05.2018  
Sample Received on : 02.06.2018  
Analysis Started On : 04.06.2018  
Analysis Completed on : 10.06.2018  
Method of Sampling : IS 5182 : Part 1 : 2006, Reaffirmed 2012

**Sampling Location Specification :**

**D<sub>1</sub> :** Roof top of the Office Building

Sl. No.	Parameter	Unit (Milligram of deposit per square meter per day)	Result*
			D <sub>1</sub>
01	Ni	mg / m <sup>2</sup> d	ND
02	Co	mg / m <sup>2</sup> d	ND
03	As	mg / m <sup>2</sup> d	ND
04	Hg	mg / m <sup>2</sup> d	ND

\*Monitoring carried out under control measures

ND : Not Detected

.....END OF TEST REPORT...

  
(Authorized Signatory)

**S.P.Pattanayak**  
**Tech.Manager**



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329 , E-mail: ersibsr@gmail.com

## ANALYSIS REPORT of DUST FALL (For Aug-2018)

Date: 10 Sep 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 01-31.08.2018  
Sample Received on : 01.09.2018  
Analysis Started On : 01.09.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 1 : 2006, Reaffirmed 2012

Sampling Location Specification :

D<sub>1</sub> : Roof top of the Office Building

Sl. No.	Parameter	Unit (Milligram of deposit per square meter per day)	Result*
			D <sub>1</sub>
01	Ni	mg / m <sup>2</sup> d	ND
02	Co	mg / m <sup>2</sup> d	ND
03	As	mg / m <sup>2</sup> d	ND
04	Hg	mg / m <sup>2</sup> d	ND

\*Monitoring carried out under control measures ND :  
Not Detected

.....END OF TEST REPORT...

  
(Authorized Signatory)  
**S.P.Pattanayak**  
Tech.Manager



# Environmental Research and Services (India) Pvt. Ltd.

## ANALYSIS REPORT of SOIL SAMPLE (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the Client.  
 Date of Sampling/Monitoring : 15-16.05.2018  
 Sample Received on : 22.05.2018  
 Analysis Started On : 28.05.2018  
 Analysis Completed on : 04.06.2018

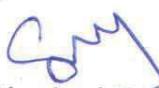
### Sampling Location Specification :

S1 : Soil sample from Eastern side of the lease hold area  
 S2 : Soil sample from Western side of the lease hold area  
 S3 : Soil sample from Northern side of the lease hold area  
 S4 : Soil sample from Southern side of the lease hold area

Sl. No.	Parameter	Unit	Result			
			S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>
01	Ni	Mg/Kg	84.5	62.0	130.0	68.0
02	Co	Mg/Kg	ND	ND	ND	ND
03	As	Mg/Kg	ND	ND	ND	ND
04	Hg	Mg/Kg	ND	ND	ND	ND

ND : Not Detected

.....END OF TEST REPORT...

  
 (Authorized Signatory)  
 S.P. Pattanayak  
 Tech. Manager



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437143248, +91-9937690329, E-mail: ersibbsr@gmail.com

## ANALYSIS REPORT of SOIL SAMPLE (For Aug-2018)

Date: 10 Sep 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 23.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018

### Sampling Location Specification :

S1 : Soil sample from Eastern side of the lease hold area  
S2 : Soil sample from Western side of the lease hold area  
S3 : Soil sample from Northern side of the lease hold area  
S4 : Soil sample from Southern side of the lease hold area

Sl. No.	Parameter	Unit	Result			
			S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>
01	Ni	Mg/Kg	42.6	32.0	41.2	28.7
02	Co	Mg/Kg	ND	ND	ND	ND
03	As	Mg/Kg	ND	ND	ND	ND
04	Hg	Mg/Kg	ND	ND	ND	ND

ND : Not Detected

  
(Authorized Signatory)

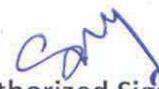
.....END OF TEST REPORT...

**S.P.Pattanayak**  
Tech.Manager

**GROUND WATER LEVEL, DEPTH FROM SURFACE****(For May-2018)**

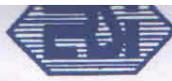
Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 15-17.05.2018  
Monitoring carried by : ERSIPL's representative  
Monitoring carried in presence of : Client's representative

Sl. No.	Location	Depth (bgL in meter)
01	Borewell Near workshop of the Mines	12.40
02	Bore well near main gate of OCM	12.60
03	Near Ostia Village (Open Well)	2.11
04	Near Ostapal Village (Open well)	10.00
05	Tube well inside the Shiva Temple of Village Gurujanga	14.00
06	Tube well outside of the Shiva Temple of Village Gurujanga	13.70
07	Eastern side of the quarry, (PZ-1)	6.80
08	Southern side of the quarry, (PZ-2)	0.63
09	Western side of the quarry, (PZ-3)	2.84

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
**Tech.Manager**



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437143248, +91-9937690329 , E-mail: ersibbsr@gmail.com

## GROUND WATER LEVEL, DEPTH FROM SURFACE

(For Aug-2018)

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 24-25.08.2018  
Monitoring carried by : ERSIPL's representative  
Monitoring carried in presence of : Client's representative

Sl. No.	Location	Depth (bgL in meter)
01	Borewell Near workshop of the Mines	10.72
02	Bore well near main gate of OCM	10.52
03	Near Ostia Village (Open Well)	0.74
04	Near Ostapal Village (Open well)	1.60
05	Tube well inside the Shiva Temple of Village Gurujanga	9.20
06	Tube well outside of the Shiva Temple of Village Gurujanga	9.35
07	Eastern side of the quarry, (PZ-1)	0.81
08	Southern side of the quarry, (PZ-2)	0.91
09	Western side of the quarry, (PZ-3)	0.76

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



# Environmental Research and Services (India) Pvt. Ltd.

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For May-2018)

Page 1of 2

**Date: 12 June 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
 Date of Sampling : 16.05.2018  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the client  
 Sample Received on : 22.05.2018  
 Analysis Started On : 24.05.2018  
 Analysis Completed on : 04.06.2018  
 Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
 Quantity of Sample : 2ltrs  
 Type of Container : Glass Bottle & HDPE Bottle  
 Environment Condition : All Tests carried out in Room Temperature:  
 Sampling Location Specification : GWQ1- Bore well near workshop of the Mines  
 GWQ2- Bore well near main gate of OCM  
 GWQ3- Open well near Ostia Village  
 GWQ4- Open well near Ostapal Village  
 GWQ5- Tube well inside the Shiva Temple of Village Gurujanga

Sl	Parameters Analysed	Unit	Permissible Limit as per IS:10500, 2012	Result				
				GWQ1	GWQ2	GWQ3	GWQ4	GWQ5
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A	A
04	Turbidity	NTU	1.0	0.1	0.6	0.1	0.1	0.1
05	pH	No	6.5 to 8.5	6.54	6.54	6.71	6.68	6.64
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	28.28	117.16	28.28	32.32	76.76
07	Total Iron	mg/L	0.3	0.22	0.11	0.25	0.14	0.27
08	Chloride	mg/L	250.0	7.71	7.71	13.49	19.28	7.71
09	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil	Nil
10	Total Dissolved Solids	mg/L	500.0	39.2	125.2	33.0	64.2	95.6
11	Calcium as Ca	mg/L	75.0	9.71	8.09	3.23	6.47	14.57
12	Magnesium as Mg	mg/L	30.0	<1.0	23.56	4.91	3.92	9.80
13	Copper	mg/L	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese	mg/L	0.1	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO <sub>4</sub>	mg/L	200.0	2.4	4.8	4.3	4.1	<1.0
16	Nitrate as NO <sub>3</sub>	mg/L	45.0	1.54	1.24	2.24	2.1	3.6
17	Fluoride	mg/L	1.0	<0.02	<0.02	<0.02	<0.02	<0.02



18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1	<0.1
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.04	0.03	0.06	0.05	0.06
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	32.0	96.0	16.0	20.0	64.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND	ND

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P. Pattanayak**  
**Tech. Manager**



18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.08	0.03	0.05	0.04
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	52.0	60.0	56.0	72.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)

**S.P.Pattanayak**  
**Tech.Manager**



Certificate No. : TC-7440



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437143248, +91-9937690329 , E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For Aug-2018)

Page 1 of 2

ULR-TC7440180-0000004P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/45

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
Date of Sampling : 22.08.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client Sample  
Received on : 27.08.2018  
Analysis Started On : 28.08.2018  
Analysis Completed on : 04.09.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature:

Sampling Location Specification :

ERSIPL/WA/647

ERSIPL/WA/648

ERSIPL/WA/649

ERSIPL/WA/650

ERSIPL/WA/651

GWQ1- Bore well near workshop of the Mines

GWQ2- Bore well near main gate of OCM

GWQ3- Open well near Ostia Village

GWQ4- Open well near Ostapal Village

GWQ5- Tube well inside the Shiva Temple of Village Gurujanga

Sl	Parameters Analysed	Unit	Permissible Limit as per IS:10500, 2012	Result				
				ERSIPL/WA/647	ERSIPL/WA/648	ERSIPL/WA/649	ERSIPL/WA/650	ERSIPL/WA/651
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A	A
04	Turbidity	NTU	1.0	0.6	0.7	0.1	0.4	0.8
05	pH	No	6.5 to 8.5	6.56	6.50	6.71	6.57	6.56
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	90.16	94.08	50.96	54.88	86.24
07	Total Iron	mg/L	0.3	0.21	0.19	0.29	0.30	0.20
08	Chloride	mg/L	250.0	15.42	15.42	17.35	21.21	19.28
09	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil	Nil
10	Total Dissolved Solids	mg/L	500.0	107.2	108.1	64.4	68.2	95.7
11	Calcium as Ca	mg/L	75.0	7.85	7.85	3.14	6.28	10.99



GSTIN : 21AAACE6224D1ZE



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Tel: +91-9437143248, +91-9937690329 , E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Page 2 of 2

12	Magnesium as Mg	mg/L	30.0	17.18	18.13	10.49	9.54	14.31
13	Copper	mg/L	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese	mg/L	0.1	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO <sup>2-</sup> 4	mg/L	200.0	2.2	1.7	3.3	4.0	7.7
16	Nitrate as NO <sub>3</sub>	mg/L	45.0	1.68	1.36	2.18	1.94	2.80
17	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1	<0.1
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1	<0.1
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.04	0.04	0.06	0.07	0.05
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	64.0	60.0	8.0	24.0	45.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND	ND

ND - Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



Certificate No. : TC-7440



# Environmental Research and Services (India) Pvt. Ltd.

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Tel: +91-9437143248, +91-9937690329 , E-mail: ersibbsr@gmail.com

Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For Aug-2018)

Page 1of 2

ULR-TC7440180-0000005P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/46

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD

Date of Sampling : 22.08.2018

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of the client

Sample Received on : 27.08.2018

Analysis Started on : 28.08.2018

Analysis Completed on : 04.09.2018

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

Sampling Location Specification :

ERSIPL/WA/652

GWQ6- Tube well outside of the Shiva Temple of Village Gurujanga

ERSIPL/WA/653

GWQ7- Eastern side of the quarry, (PZ-1)

ERSIPL/WA/654

GWQ8- Southern side of the quarry, (PZ-2)

ERSIPL/WA/655

GWQ9- Western side of the quarry, (PZ-3)

Sl	Parameters Analysed	Unit	Permissible Limit as per IS:10500, 2012	Result			
				ERSIPL/WA/652	ERSIPL/WA/653	ERSIPL/WA/654	ERSIPL/WA/655
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	Turbidity	NTU	1.0	0.6	0.3	0.4	0.7
05	pH	No	6.5 to 8.5	6.52	7.28	7.39	7.31
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	78.4	50.96	54.88	54.88
07	Total Iron	mg/L	0.3	0.21	0.15	0.08	0.17
08	Chloride	mg/L	250.0	21.21	11.57	11.57	17.35
09	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
10	Total Dissolved Solids	mg/L	500.0	95.5	78.9	77.4	76.7
11	Calcium as Ca	mg/L	75.0	12.57	4.71	6.28	7.85
12	Magnesium as Mg	mg/L	30.0	11.45	9.54	9.54	8.59



GSTIN : 21AAACE6224D1ZE



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Ref. No. ....

Date.....

Page 2 of 2

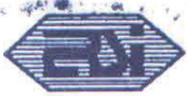
13	Copper	mg/L	0.05	<0.02	<0.02	<0.02	<0.02
14	Manganese	mg/L	0.1	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO <sup>2-</sup> 4	mg/L	200.0	<1.0	<1.0	<1.0	<1.0
16	Nitrate as NO <sub>3</sub>	mg/L	45.0	1.24	1.40	2.10	2.48
17	Fluoride	mg/L	1.0	<0.02	<0.02	<0.02	<0.02
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	<0.1	<0.1	<0.1	<0.1
26	Anionicdetergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	0.06	0.04	0.05	0.04
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	52.0	32.0	32.0	28.0
32	Aluminium	mg/L	0.03	ND	ND	ND	ND
33	Boron	mg/L	0.5	ND	ND	ND	ND
34	Nickel	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech. Manager



# Environmental Research and Services (India) Pvt. Ltd.

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For May-2018)

**Date: 12 June 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
 Date of Sampling : 16.05.2018  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the client  
 Sample Received on : 22.05.2018  
 Analysis Started On : 24.05.2018  
 Analysis Completed on : 04.06.2018  
 Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
 Quantity of Sample : 2ltrs  
 Type of Container : Glass Bottle & HDPE Bottle  
 Environment Condition : All Tests carried out in Room Temperature:  
 Sampling Location Specification : GWQ1- Borewell Near workshop of the Mines  
 GWQ2- Bore well near main gate of OCM  
 GWQ3- Open well near Ostia Village  
 GWQ4- Open well near Ostapal Village  
 GWQ5- Tube well inside of the Shiva Temple of Village Gurujanga  
 GWQ6- Tube well outside of the Shiva Temple of Village Gurujanga  
 GWQ7- Eastern side of the quarry, (PZ-1)  
 GWQ8- Southern side of the quarry, (PZ-2)  
 GWQ9- Western side of the quarry, (PZ-3)

Sl	Parameters Analysed	Result in mg/L								
		GWQ1	GWQ2	GWQ3	GWQ4	GWQ5	GWQ6	GWQ7	GWQ8	GWQ9
01	Hexavalent Chromium	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

.....END OF TEST REPORT.....

  
 (Authorized Signatory)

**S.P. Pattanayak**  
 Tech. Manager



Certificate No. : TC-7440

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/ICE 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF GROUND WATER SAMPLE (For Aug-2018)

ULR-TC7440180-00000006P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/47

Name and Address of the Customer

: Ostapal Chromite Mines of M/S FACOR LTD

Date of Sampling

: 22.08.2018

Sample Collected by

: Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of

: Representative of the client

Sample Received on

: 27.08.2018

Analysis Started on

: 28.08.2018

Analysis Completed on

: 04.09.2018

Method of Sampling

: IS 3025: Part 1: 1987, Reaffirmed 2014

Quantity of Sample

: 2ltrs

Type of Container

: Glass Bottle &amp; HDPE Bottle

Environment Condition

: All Tests carried out in Room Temperature

Sampling Location Specification

:

ERSIPL/WA/647

GWQ1- Bore well near workshop of the Mines

ERSIPL/WA/648

GWQ2- Bore well near main gate of OCM

ERSIPL/WA/649

GWQ3- Open well near Ostia Village

ERSIPL/WA/650

GWQ4- Open well near Ostapal Village

ERSIPL/WA/651

GWQ5- Tube well inside the Shiva Temple of Village Gurujanga

ERSIPL/WA/652

GWQ6- Tube well outside of the Shiva Temple of Village Gurujanga

ERSIPL/WA/653

GWQ7- Eastern side of the quarry, (PZ-1)

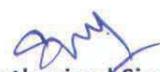
ERSIPL/WA/654

GWQ8- Southern side of the quarry, (PZ-2)

ERSIPL/WA/655

GWQ9- Western side of the quarry, (PZ-3)

Sl	Parameters Analysed	Result in mg/L								
		ERSIPL/WA/647	ERSIPL/WA/648	ERSIPL/WA/649	ERSIPL/WA/650	ERSIPL/WA/651	ERSIPL/WA/652	ERSIPL/WA/653	ERSIPL/WA/654	ERSIPL/WA/655
01	Hexavalent Chromium	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager

**ANNEXURE – 4**

**CALENDAR PLAN INCLUDING EXCAVATION, QUANTUM OF MINERAL CHROMITE AND  
WASTE GENERATED DURING THE PERIOD 2017-2018  
IN OSTAPAL CHROMITE MINES**

SL. NO.	MATERIALS	CALENDER PLAN PER ANNUM	QUANTITY GENERATED DURING THE PERIOD FROM APRIL, 2017 TO MARCH, 2018
01.	CHROME ORE	1.042 Lakh Tonnes	1.062 Lakh Tonnes
02.	WASTE OVER BURDEN	4.80 Lakh M <sup>3</sup>	3.508 Lakh M <sup>3</sup>


**TEST REPORT (AMBIENT AIR)**
**Date: 19 May 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
 Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
 Sample Collected in presence of : Representative of the Client.  
 Date of Sampling/Monitoring : 29-30.04.2018  
 Sample Received on : 02.05.2018  
 Analysis Started On : 03.05.2018  
 Analysis Completed on : 14.05.2018  
 Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
 Quantity of Sample : 01 sample for each parameter  
 Environment Condition : Sunny, Temp-38<sup>o</sup>C/23<sup>o</sup>C

**Sample ID. No.**

1. ERSIPL/AA/407
2. ERSIPL/AA/408
3. ERSIPL/AA/405
4. ERSIPL/AA/406

**Locations (Core Zone)**

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

**TEST FINDINGS:**

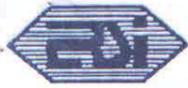
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/407	ERSIPL/AA/408	ERSIPL/AA/405	ERSIPL/AA/406
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	40.39	86.42	95.58	78.84
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	17.88	57.03	41.49	31.86
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.25	8.68	<6.0	<6.0
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	21.14	<9.0	10.07
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR)

Date: 19 May 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 29-30.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-38<sup>0</sup>C/23<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/407
2. ERSIPL/AA/408
3. ERSIPL/AA/405
4. ERSIPL/AA/406

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/407	ERSIPL/AA/408	ERSIPL/AA/405	ERSIPL/AA/406
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



**TEST REPORT (AMBIENT AIR)**

**Date: 19 May 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 28-29.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-39°C/22°C

**Sample ID. No.**

**Locations (Buffer Zone)**

- |                   |                            |
|-------------------|----------------------------|
| 1. ERSIPL/AA/402  | 1. Near Village Ostia      |
| 2. ERSIPL/AA/403  | 2. Near Village Koiposi    |
| 3. ERSIPL/AA/403A | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/404  | 4. Near Village Ostapal    |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/402	ERSIPL/AA/403	ERSIPL/AA/403A	ERSIPL/AA/404
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	82.35	87.46	85.42	90.21
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	41.79	39.86	41.65	45.54
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	13.62	<6.0	6.48	7.15
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	21.08	26.32	15.24	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 19 May 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 28-29.04.2018  
Sample Received on : 02.05.2018  
Analysis Started On : 03.05.2018  
Analysis Completed on : 14.05.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-39<sup>0</sup>C/22<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/402
2. ERSIPL/AA/403
3. ERSIPL/AA/403A
4. ERSIPL/AA/404

### Locations (Buffer Zone)

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A/402	ERSIPL/AA/403	ERSIPL/AA/403A	ERSIPL/AA/404
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Pg No: 1 of 1

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 15-16.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35<sup>o</sup>C/22<sup>o</sup>C

### Sample ID. No.

### Locations (Core Zone)

- |                 |                                     |
|-----------------|-------------------------------------|
| 1. ERSIPL/AA/C1 | 1. Near Dispensary                  |
| 2. ERSIPL/AA/C2 | 2. Near Weighbridge                 |
| 3. ERSIPL/AA/C3 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/C4 | 4. At Middle of the COB Plant       |

### TEST FINDINGS:

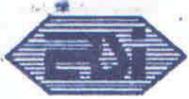
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/C1	ERSIPL/AA/C2	ERSIPL/AA/C3	ERSIPL/AA/C4
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	91.49	55.95	72.77	82.19
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	34.51	29.32	33.48	40.58
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	11.20	<6.0	15.49	8.18
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	<9.0	<9.0	18.89
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



# Environmental Research and Services (India) Pvt. Ltd.

## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 15-16.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35<sup>0</sup>C/22<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/C1
2. ERSIPL/AA/C2
3. ERSIPL/AA/C3
4. ERSIPL/AA/C4

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/ AA/C1	ERSIPL/ AA/C2	ERSIPL/ AA/C3	ERSIPL/ AA/C4
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Pg No: 1 of 1

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 16-17.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-36<sup>0</sup>C/23<sup>0</sup>C

**Sample ID. No.****Locations (Buffer Zone)**

- |                 |                            |
|-----------------|----------------------------|
| 1. ERSIPL/AA/B1 | 1. Near Village Ostia      |
| 2. ERSIPL/AA/B2 | 2. Near Village Koiposi    |
| 3. ERSIPL/AA/B3 | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/B4 | 4. Near Village Ostapal    |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/B1	ERSIPL/AA/B2	ERSIPL/AA/B3	ERSIPL/AA/B4
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed - 2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	69.21	72.05	63.19	88.12
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	30.36	38.70	28.08	57.32
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	12.43	12.39	10.82	12.35
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	17.36	13.76	20.32	11.04
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

.....END OF TEST REPORT.....

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



# Environmental Research and Services (India) Pvt. Ltd.

## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 16-17.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-36<sup>0</sup>C/23<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/B1
2. ERSIPL/AA/B2
3. ERSIPL/AA/B3
4. ERSIPL/AA/B4

### Locations (Buffer Zone)

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/A A/B1	ERSIPL/AA/B2	ERSIPL/AA/B3	ERSIPL/AA/B4
1	Ozone (O3) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m3	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m3	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m3	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m3	20.0	ND	ND	ND	ND
5	Ammonia (NH3)		µg/m3	400.0	ND	ND	ND	ND
6	Benzene (C6H6),		µg/m3	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m3	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

  
(Authorized Signatory)

**S.P.Pattanayak**  
Tech. Manager

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 22-23.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-33<sup>0</sup>C/26<sup>0</sup>C

### Sample ID. No.

### Locations (Core Zone)

- |                  |                                     |
|------------------|-------------------------------------|
| 1. ERSIPL/AA/544 | 1. Near Dispensary                  |
| 2. ERSIPL/AA/545 | 2. Near Weighbridge                 |
| 3. ERSIPL/AA/546 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/547 | 4. At Middle of the COB Plant       |

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/544	ERSIPL/AA/545	ERSIPL/AA/546	ERSIPL/AA/547
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	92.82	82.40	77.24	88.81
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	29.72	33.70	34.77	39.02
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.65	6.54	6.36	7.99
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	9.78	10.61	12.92	9.47
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 22-23.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-33°C/26°C

### Sample ID. No.

1. ERSIPL/AA/544
2. ERSIPL/AA/545
3. ERSIPL/AA/546
4. ERSIPL/AA/547

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/544	ERSIPL/AA/545	ERSIPL/AA/546	ERSIPL/AA/547
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 23-24.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-34<sup>0</sup>C/26<sup>0</sup>C

### Sample ID. No.

### Locations (Buffer Zone)

- |                  |                            |
|------------------|----------------------------|
| 1. ERSIPL/AA/548 | 1. Near Village Ostia      |
| 2. ERSIPL/AA/549 | 2. Near Village Koiposi    |
| 3. ERSIPL/AA/550 | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/551 | 4. Near Village Ostapal    |

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/548	ERSIPL/AA/549	ERSIPL/AA/550	ERSIPL/AA/551
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	70.92	86.57	97.58	88.68
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	40.97	41.76	44.90	37.99
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.19	6.50	9.39	<6.0
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	12.01	8.43	15.08	<9.0
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 07 July 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 23-24.06.2018  
Sample Received on : 26.06.2018  
Analysis Started On : 27.06.2018  
Analysis Completed on : 30.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-34°C/26°C

### Sample ID. No.

1. ERSIPL/AA/548
2. ERSIPL/AA/549
3. ERSIPL/AA/550
4. ERSIPL/AA/551

### Locations (Buffer Zone)

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

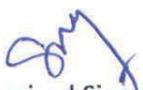
### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A A/548	ERSIPL/ AA/549	ERSIPL/ AA/550	ERSIPL/ AA/551
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/11

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 24-25.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-33<sup>0</sup>C/27<sup>0</sup>C

### Sample ID. No.

### Locations (Core Zone)

- |                  |                                     |
|------------------|-------------------------------------|
| 1. ERSIPL/AA/597 | 1. Near Dispensary                  |
| 2. ERSIPL/AA/598 | 2. Near Weighbridge                 |
| 3. ERSIPL/AA/599 | 3. At Middle of the Opencast Quarry |
| 4. ERSIPL/AA/600 | 4. At Middle of the COB Plant       |

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/597	ERSIPL/AA/598	ERSIPL/AA/599	ERSIPL/AA/600
1	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	79.94	85.94	84.01	73.44
2	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	28.63	30.24	41.71	33.37
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	6.82	9.21	7.13	8.76
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	9.16	10.12	13.62
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/11N

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 24-25.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-33<sup>0</sup>C/27<sup>0</sup>C

### Sample ID. No.

1. ERSIPL/AA/597
2. ERSIPL/AA/598
3. ERSIPL/AA/599
4. ERSIPL/AA/600

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A A/597	ERSIPL/ AA/598	ERSIPL/ AA/599	ERSIPL/ AA/600
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/12

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 25-26.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-34<sup>o</sup>C/25<sup>o</sup>C

### Sample ID. No.

### Locations (Buffer Zone)

- |                  |                            |
|------------------|----------------------------|
| 1. ERSIPL/AA/601 | 1. Near Village Ostia      |
| 2. ERSIPL/AA/602 | 2. Near Village Koiposi    |
| 3. ERSIPL/AA/603 | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/604 | 4. Near Village Ostapal    |

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/AA/601	ERSIPL/AA/602	ERSIPL/AA/603	ERSIPL/AA/604
1	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	67.55	68.93	69.82	77.56
2	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM <sub>2.5</sub>	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	$\mu\text{g}/\text{m}^3$	60.0	25.40	26.84	26.74	30.92
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.59	6.65	7.87	7.22
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	9.48	9.59	10.25	11.93
5	Carbon Monoxide (CO)	By CO Monitor	$\text{mg}/\text{m}^3$	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out under control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....



## TEST REPORT (AMBIENT AIR)

Date: 11 Aug 2018

Test Report No: ERSIPL/TR/AA/12N

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 25-26.07.2018  
Sample Received on : 02.08.2018  
Analysis Started On : 04.08.2018  
Analysis Completed on : 08.08.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy, Temp-34°C/25°C

### Sample ID. No.

1. ERSIPL/AA/601
2. ERSIPL/AA/602
3. ERSIPL/AA/603
4. ERSIPL/AA/604

### Locations (Buffer Zone)

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit	Results*			
					ERSIPL/A A/601	ERSIPL/ AA/602	ERSIPL/ AA/603	ERSIPL/ AA/604
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants; Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulate phase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out under control measures

Note: ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

Pg No: 1 of 1

ULR-TC7440180-0000008P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/AA/32

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 21-22.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy, Temp-32°C/25°C

### Sample ID. No.

1. ERSIPL/AA/658A
2. ERSIPL/AA/659
3. ERSIPL/AA/660
4. ERSIPL/AA/661

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/658A	ERSIPL/AA/659	ERSIPL/AA/660	ERSIPL/AA/661
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	74.23	68.58	78.56	72.94
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	32.25	31.61	24.58	36.27
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.67	7.28	<6.0	7.42
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	9.65	9.70	9.76	11.10
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

Pg No: 1 of 1

**Date: 10 Sep 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 21-22.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy, Temp-32°C/25°C

**Sample ID. No.**

1. ERSIPL/AA/658A
2. ERSIPL/AA/659
3. ERSIPL/AA/660
4. ERSIPL/AA/661

**Locations (Core Zone)**

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/ AA/658A	ERSIPL/ AA/659	ERSIPL/ AA/660	ERSIPL/ AA/661
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene (BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures Note:

ND = Not Detected

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager

.....END OF TEST REPORT.....



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

ULR-TC7440180-0000009P

Pg No: 1 of 1

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/AA/33

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client  
Date of Date of Sampling/Monitoring : 22-23.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy/Sunny, Temp-33°C/26°C

### Sample ID. No.

### Locations (Buffer Zone)

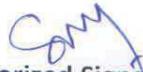
1. ERSIPL/AA/662
2. ERSIPL/AA/663
3. ERSIPL/AA/664
4. ERSIPL/AA/665

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

### TEST FINDINGS:

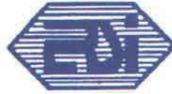
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/662	ERSIPL/AA/663	ERSIPL/AA/664	ERSIPL/AA/665
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed-2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	82.68	71.55	74.68	74.58
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01, Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	25.12	26.44	30.19	30.12
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	8.52	8.07	7.15	7.59
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	<9.0	11.36	13.29	10.46
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....

S.P.Pattanayak  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

Pg No: 1 of 1

**Date: 10 Sep 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the  
Date of Sampling/Monitoring : 22-23.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy/Sunny, Temp-33°C/26°C

**Sample ID. No.****Locations (Buffer Zone)**

- |                  |                            |
|------------------|----------------------------|
| 1. ERSIPL/AA/662 | 1. Near Village Ostia      |
| 2. ERSIPL/AA/663 | 2. Near Village Koiposi    |
| 3. ERSIPL/AA/664 | 3. Near Kaliapani Township |
| 4. ERSIPL/AA/665 | 4. Near Village Ostapal    |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/662	ERSIPL/AA/663	ERSIPL/AA/664	ERSIPL/AA/665
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene(BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

  
(Authorized Signatory)

.....END OF TEST REPORT

**S.P.Pattanayak**  
Tech. Manager



# Environmental Research and Services (India) Pvt. Ltd.



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

Pg No: 1 of 1

ULR-TC7440180-00000047P

Date: 03 Oct 2018

Test Report No: ERSIPL/TR/AA/50

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 10-11.09.2018  
Sample Received on : 17.09.2018  
Analysis Started On : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-34°C/25°C

### Sample ID. No.

1. ERSIPL/AA/712
2. ERSIPL/AA/713
3. ERSIPL/AA/714
4. ERSIPL/AA/715

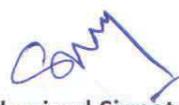
### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/712	ERSIPL/AA/713	ERSIPL/AA/714	ERSIPL/AA/715
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	69.11	56.66	72.63	69.08
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01 Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	32.31	33.13	26.05	24.55
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.60	7.77	8.04	8.17
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	12.24	10.46	16.67	12.92
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 2015 Certified Company)

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

Pg No: 1 of 1

Date: 03 Oct 2018  
Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 10-11.09.2018  
Sample Received on : 17.09.2018  
Analysis Started On : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-34°C/25°C

### Sample ID. No.

1. ERSIPL/AA/712
2. ERSIPL/AA/713
3. ERSIPL/AA/714
4. ERSIPL/AA/715

### Locations (Core Zone)

1. Near Dispensary
2. Near Weighbridge
3. At Middle of the Opencast Quarry
4. At Middle of the COB Plant

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results*			
					ERSIPL/AA/712	ERSIPL/AA/713	ERSIPL/AA/714	ERSIPL/AA/715
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene(BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures Note:  
ND = Not Detected

(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P. Pattanayak**  
Tech. Manager



# Environmental Research and Services (India) Pvt. Ltd.



(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

ULR-TC7440180-00000048P

Pg No: 1 of 1

Date: 03 Oct 2018

Test Report No: ERSIPL/TR/AA/51

Name and Address of the Customer :- Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client  
Date of Sampling/Monitoring : 11-12/13-14.09.2018  
Sample Received on : 17.09.2018  
Analysis Started On : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35<sup>0</sup>C/24<sup>0</sup>C

### Sample ID. No.

### Locations (Buffer Zone)

1. ERSIPL/AA/716
2. ERSIPL/AA/717
3. ERSIPL/AA/718
4. ERSIPL/AA/719

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/716	ERSIPL/AA/717	ERSIPL/AA/718	ERSIPL/AA/719
1	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed-2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	69.61	75.44	74.79	73.27
2	Particulate Matter (size less than 2.5 µm) or PM 2.5	ERSIPL/SOP/01, Issue No:02, Revision Date: 19.02.2018	µg/m <sup>3</sup>	60.0	35.43	26.93	31.95	33.06
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.54	6.02	<6.0	<6.0
4	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	13.82	15.16	12.36	12.30
5	Carbon Monoxide (CO)	By CO Monitor	mg/m <sup>3</sup>	2.0	<1.14	<1.14	<1.14	<1.14

\*Monitoring carried out with control measures

  
(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Sept-2018)

Pg No: 1 of 1

**Date: 03 Oct 2018**  
Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the  
Date of Sampling/Monitoring : 11-12/13-14.09.2018  
Sample Received on : 17.09.2018  
Analysis Started On : 18.09.2018  
Analysis Completed on : 25.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-35<sup>0</sup>C/24<sup>0</sup>C

**Sample ID. No.**

1. ERSIPL/AA/716
2. ERSIPL/AA/717
3. ERSIPL/AA/718
4. ERSIPL/AA/719

**Locations (Buffer Zone)**

1. Near Village Ostia
2. Near Village Koiposi
3. Near Kaliapani Township
4. Near Village Ostapal

**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB, Nov-2009	Results*			
					ERSIPL/AA/716	ERSIPL/AA/717	ERSIPL/AA/718	ERSIPL/AA/719
1	Ozone (O <sub>3</sub> ) 8 Hrly	As per Guidelines for the measurement of Ambient Air Pollutants, Vol - I, CPCB, May 2011	µg/m <sup>3</sup>	100.0	<19.6	<19.6	<19.6	<19.6
2	Lead (Pb)		µg/m <sup>3</sup>	1.0	ND	ND	ND	ND
3	Arsenic (As)		ng/m <sup>3</sup>	6.0	ND	ND	ND	ND
4	Nickel (Ni)		ng/m <sup>3</sup>	20.0	ND	ND	ND	ND
5	Ammonia (NH <sub>3</sub> ),		µg/m <sup>3</sup>	400.0	ND	ND	ND	ND
6	Benzene (C <sub>6</sub> H <sub>6</sub> ),		µg/m <sup>3</sup>	5.0	ND	ND	ND	ND
7	Benzo(a)Pyrene(BaP) Particulatephase only		ng/m <sup>3</sup>	1.0	ND	ND	ND	ND

\*Monitoring carried out with control measures

Note: ND = Not Detected

.....END OF TEST REPORT

  
(Authorized Signatory)**S.P.Pattanayak**  
Tech.Manager



## TEST REPORT (AMBIENT AIR) (For May-2018)

Date: 12 June 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 15/17.05.2018  
Sample Received on : 22.05.2018  
Analysis Started On : 28.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny, Temp-32<sup>0</sup>C/29<sup>0</sup>C

**Sample ID. No.**

**Locations**

- |  |                                       |
|--|---------------------------------------|
| 1. ERSIPL/AA/AQF1 (Fugitive Emission)  | 1. Near Mines Ore Plot Area           |
| 2. ERSIPL/AA/ AQF2 (Fugitive Emission) | 2. Near COB Plant area                |
| 3. ERSIPL/AA/ AQF3 (Fugitive Emission) | 3. Near Mines Loading Unloading Point |

**TEST FINDINGS:**

Sl. No	Test Parameters	Test Method	Unit	Results*		
				ERSIPL/ AA/ AQF1	ERSIPL/ AA/ AQF2	ERSIPL/ AA/ AQF3
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)-1999, Reaffirmed 2014, Gravimetric Method	µg/m <sup>3</sup>	141.83	149.51	400.77

\*Monitoring carried out with control measures

.....END OF TEST REPORT...

(Authorized Signatory)

**S.P.Pattanayak**  
Tech.Manager



Certificate No. : TC-7440



# Environmental Research and Services (India) Pvt. Ltd.

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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR) (For Aug-2018)

ULR-TC7440180-00000010F

Pg No: 1 of 1

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/AA/34

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the Client.  
Date of Sampling/Monitoring : 22.08.2018  
Sample Received on : 27.08.2018  
Analysis Started On : 30.08.2018  
Analysis Completed on : 03.09.2018  
Method of Sampling : IS 5182 : Part 5 : 1975, Reaffirmed 2014  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy/Sunny, Temp-33<sup>0</sup>C/30<sup>0</sup>C

Sample ID. No.Locations

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| 1. ERSIPL/AA/666 (Fugitive Emission)  | 1. Near Mines Ore Plot Area           |
| 2. ERSIPL/AA/ 667 (Fugitive Emission) | 2. Near COB Plant area                |
| 3. ERSIPL/AA/ 668 (Fugitive Emission) | 3. Near Mines Loading Unloading Point |

**TEST FINDINGS:**

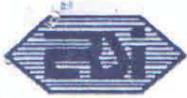
Sl. No	Test Parameters	Test Method	Unit	Results*		
				ERSIPL/ AA/ 666	ERSIPL/ AA/ 667	ERSIPL/ AA/ 668
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)-1999, Reaffirmed 2014, Gravimetric Method	µg/m <sup>3</sup>	268.81	190.21	321.55

\*Monitoring carried out with control measures

  
(Authorized Signatory)

.....END OF TEST REPORT...

S.P.Pattanayak  
Tech.Manager

**Environmental Research and Services (India) Pvt. Ltd.****NOISE LEVEL MEASUREMENT REPORT  
(For May-2018)****Date: 12 June 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD

Date of Monitoring : 16.05.2018

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of the client

Sl. No	Location	Result in dB (A)	
		Day Time (6.00 A. M. – 10.00 P.M.)	Night Time (10.00 P.M. – 6.00 A.M.)
1	Opencast quarry	68.9	59.2
2	Ambient COB Plant Area	74.5	60.8
3	Mines Loading Unloading Point	68.2	65.2

**Ambient Noise Level Standards**

Area Code	Category of Area / Zone	Limits in dB(A)	
		Day Time (6.00 a.m. to 10.00 p.m.)	Night Time (10.00 p.m. to 6.00 a.m.)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

  
(Authorized Signatory)

.....END OF TEST REPORT.....

S.P.Pattanayak  
Tech. Manager



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## NOISE LEVEL MEASUREMENT REPORT (For Aug-2018)

Date: 10 Sept 2018

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
Date of Monitoring : 23.08.2018  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of the client

Sl. No	Location	Result in dB (A)	
		Day Time (6.00 A. M. – 10.00 P.M.)	Night Time (10.00 P.M. – 6.00 A.M.)
1	Opencast quarry	63.4	50.2
2	Ambient COB Plant Area	70.9	68.5
3	Mines Loading Unloading Point	65.5	49.8

### Ambient Noise Level Standards

Area Code	Category of Area / Zone	Limits in dB(A)	
		Day Time (6.00 a.m. to 10.00 p.m.)	Night Time (10.00 p.m. to 6.00 a.m.)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

(Authorized Signatory)

.....END OF TEST REPORT.....

**S.P.Pattanayak**  
Tech.Manager

**ANALYSIS REPORT OF EFFLUENT WATER SAMPLE  
(For May-2018)****Date: 12 June 2018**

Name and Address of the Customer : Ostapal Chromite Mines of M/S FACOR LTD  
Date of Sampling : 16.05.2018  
Sample Collected by : Representative of ERS (I) Pvt.  
Ltd. Sample Collected in presence of : Representative of the client  
Sample Received on : 22.05.2018  
Analysis Started On : 24.05.2018  
Analysis Completed on : 04.06.2018  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2014  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature:  
Sampling Location Specification : EWQ1- Mines Final Discharge Water after Treatment in ETP

Sl.	Parameters Analysed	Unit	Permissible Limit As per G.S.R. 422(E) dated 19.05.1993	Result
				EWQ-1
01	Colour	Hazen	5.0	2.0
02	Odour	--	Agreeable (A)	A
03	Suspended Solids	mg/L	100.0	12.40
04	pH value	No.	5.5 - 9.0	7.11
05	Temperature	<sup>o</sup> C	Shall not exceed 5 <sup>o</sup> C above the receiving water temperature	NOT APPLICABLE
06	Oil & Grease	mg/L	10.0	<1.0
07	Total Residual Chlorine	mg/L	1.0	Nil
08	Ammonical Nitrogen (as N)	mg/L	50.0	0.84
09	Total Kjeldahl Nitrogen (as NH <sub>3</sub> )	mg/L	100.0	3.0
10	Free Ammonia (as NH <sub>3</sub> )	mg/L	5.0	0.5
11	BOD @ 27 <sup>o</sup> C 3Days	mg/L	30.0	4.0



12	COD	mg/L	250.0	18.0
13	Arsenic (as As)	mg/L	0.2	ND
14	Mercury (as Hg)	mg/L	0.01	ND
15	Lead (as Pb)	mg/L	0.1	ND
16	Cadmium (as Cd)	mg/L	2.0	ND
17	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.1	0.08
18	Total Chromium (as Cr)	mg/L	2.0	1.76
19	Copper (as Cu)	mg/L	3.0	ND
20	Zinc (as Zn)	mg/L	5.0	ND
21	Selenium (as Se)	mg/L	0.05	ND
22	Nickel (as Ni)	mg/L	3.0	ND
23	Cyanide (as CN)	mg/L	0.2	ND
24	Fluoride (as F)	mg/L	2.0	0.46
25	Dissolved Phosphates (as P)	mg/L	5.0	1.46
26	Sulphide (as S)	mg/L	2.0	<0.1
27	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	1.0	ND
28	Manganese (as Mn)	mg/L	2.0	ND
29	Iron (as Fe)	mg/L	3.0	2.28
30	Vanadium (as V)	mg/L	0.2	ND
31	Nitrate Nitrogen	mg/L	10.0	0.8
32	Particle Size of Suspended Solids	--	shall pass 850 micron IS Sieve	Passed 850 micron IS Sieve
33	Bio-assay Test	--	90% survival of fish after 96 hrs in 100% effluent	95% Survival of fish after 96 hrs in 100% effluent
34	Dissolved Oxygen	mg/L	--	4.8
35	Total Coliform	MPN/100 ml	--	12.0

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager



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Ref. No. ....

Date.....

Test Report Format No.: ERSIPL/FM/40

## ANALYSIS REPORT OF EFFLUENT WATER SAMPLE (For Aug-2018)

Page 1 of 2

ULR-TC7440180-00000007P

Date: 10 Sep 2018

Test Report No: ERSIPL/TR/WA/48

Name and Address of the Customer	:	Ostapal Chromite Mines of M/S FACOR LTD
Date of Sampling	:	22.08.2018
Sample Collected by	:	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	:	Representative of the client
Sample Received on	:	27.08.2018
Analysis Started on	:	28.08.2018
Analysis Completed on	:	04.09.2018
Method of Sampling	:	IS 3025: Part 1: 1987, Reaffirmed 2014
Quantity of Sample	:	2ltrs
Type of Container	:	Glass Bottle & HDPE Bottle
Environment Condition	:	All Tests carried out in Room Temperature
Sampling Location Specification	:	

ERSIPL/WA/656

EWQ1- Mines Final Discharge Water after Treatment in ETP

Sl.	Parameters Analysed	Unit	Permissible Limit As per G.S.R. 422(E) dated 19.05.1993	Result
				ERSIPL/ WA/656
01	Colour	Hazen	5.0	<5.0
02	Odour	--	Agreeable (A)	A
03	Suspended Solids	mg/L	100.0	20.40
04	pH value	No.	5.5 – 9.0	7.47
05	Temperature	°C	Shall not exceed 5 <sup>0</sup> C above the receiving water temperature	NOT APPLICABLE
06	Oil & Grease	mg/L	10.0	<10.0
07	Total Residual Chlorine	mg/L	1.0	Nil
08	Ammonical Nitrogen (as N)	mg/L	50.0	0.60



GSTIN : 21AAACE6224D1ZE



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Ref. No. ....

Date.....

Page 2 of 2

09	Total Kjeldahl Nitrogen (as NH <sub>3</sub> )	mg/L	100.0	2.0
10	Free Ammonia (as NH <sub>3</sub> )	mg/L	5.0	0.4
11	BOD @ 27°C 3Days	mg/L	30.0	2.6
12	COD	mg/L	250.0	10.40
13	Arsenic (as As)	mg/L	0.2	ND
14	Mercury (as Hg)	mg/L	0.01	ND
15	Lead (as Pb)	mg/L	0.1	ND
16	Cadmium (as Cd)	mg/L	2.0	ND
17	Hexavalent Chromium (as Cr <sup>+6</sup> )	mg/L	0.1	0.10
18	Total Chromium (as Cr)	mg/L	2.0	1.84
19	Copper (as Cu)	mg/L	3.0	ND
20	Zinc (as Zn)	mg/L	5.0	ND
21	Selenium (as Se)	mg/L	0.05	ND
22	Nickel (as Ni)	mg/L	3.0	ND
23	Cyanide (as CN)	mg/L	0.2	ND
24	Fluoride (as F)	mg/L	2.0	0.38
25	Dissolved Phosphates (as P)	mg/L	5.0	0.41
26	Sulphide (as S)	mg/L	2.0	<0.1
27	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	1.0	ND
28	Manganese (as Mn)	mg/L	2.0	ND
29	Iron (as Fe)	mg/L	3.0	1.85
30	Vanadium (as V)	mg/L	0.2	ND
31	Nitrate Nitrogen	mg/L	10.0	0.4
32	Particle Size of Suspended Solids	--	shall pass 850 micron IS Sieve	Passed 850 micron IS Sieve
33	Bio-assay Test	--	90% survival of fish after 96 hrs in 100% effluent	96% Survival of fish after 96 hrs in 100% effluent
34	Dissolved Oxygen	mg/L	--	3.8
35	Total Coliform	MPN/100 ml	--	10.0

ND - Not Detected

.....END OF TEST REPORT.....

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager

**DETAILS OF EXPENDITURE INCURRED ON ENVIRONMENTAL PROTECTION MEASURES DURING THE YEAR 2017-18 AND PROPOSED BUDGETED AMOUNT FOR THE YEAR 2018-19 BY OSTAPAL CHROMITE MINES**

Sl. No.	I T E M	Expenses during the Year 2017-18 (in Rupees ₹)	Proposed budgeted amount for the year 2018-19 (in Rupees ₹)
1.	<b>AFFORESTATION</b>		
a)	Seedlings @ Rs.56/- each	3,62,040	5,20,000
b)	Fertilizer/Insecticide/Cow-dung(@ Rs. 11)	71,000	97,500
c)	Digging of Pits/Planting (Labor cost)	2,00,100	2,47,610
d)	Post Plantation care @ Rs. 155/- (Watering, Weeding, basin making etc.)	10,02,075	13,20,000
e)	Supervising	4,84,000	4,88,000
	<b>Sub-Total</b>	<b>21,19,215</b>	<b>26,73,110</b>
2.	<b>WATER MANAGEMENT &amp; TREATMENT</b>		
a)	ETP Operation & Maintenance (including costs of chemical & Manpower)	16,00,000	17,50,000
b)	Power Consumption	8,73,730	9,00,000
c)	Sludge disposal	58,000	70,000
d)	Water sample analysis	1,15,404	70,000
	<b>Sub-Total</b>	<b>26,47,134</b>	<b>27,90,000</b>
3.	<b>DUST SUPPRESSION &amp; AIR MONITORING</b>		
a)	Water spraying at dust generating points by water tanker around 205 days in a year @ Rs.817/- per trip costing 10 trips per day (10 x 817 x 205)	16,74,850	18,50,000
b)	Air monitoring charges	1,86,440	2,30,000
c)	Noise level measurement	7,080	10,000
	<b>Sub-Total</b>	<b>18,68,370</b>	<b>20,90,000</b>
	<b>Grand Total</b>	<b>Rs.66,34,719/-</b>	<b>Rs.75,53,110/-</b>