

MONITORING FORM

If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
ex.) Responses/Actions to Comments and Guidance from Government Authorities	July- September 2022

2. Mitigation Measures

The summary of the Environmental Monitoring is shown below.

[Construction Phase]

Item	Parameter	Frequency and Duration	Locations(At least)
Air	PM ₁₀	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC	20 locations
Water	Groundwaterquality (IS 10500:1991)	Once/6months During entire civil construction stage or even later, if directed by DMRC	20 locations
Noise	Noise Level (Leq and Lmax)	24hours Once/week During entire civil construction stage or even later, if directed by DMRC	30 locations
Vibration	Vibration (RMS)	24hours Once/week During entire civil construction stage or even later, if directed by DMRC	10 locations
Soil	Heavy Metal	Once/6moths During entire civil construction stage	In each Underground Construction Contract
Ecology	Felled and planted trees	Once a year till all trees that were to be planted by Delhi Government on behalf of DMRC, are	All the trees felled and newly planted trees

		planted	
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[Operation Phase]

Item	Parameter	Frequency and Duration	Locations
Air	PM ₁₀	2×24hours Once/month For 3years	10 locations
	PM _{2.5}	24 hours Once/month For 3 years	10 locations
	SOX	24 hours Once/month For 3 years	10 locations
	NOX	24 hours Once/month For 3 years	10 locations
Water	Effluent	Once/4months For 3years	3 locations(Depot)
	Groundwater quality (IS 10500:1991)	Once/year For 3years	3 locations(Depot)
Noise	Noise Level (Leq)	24hours Once/year For 3years	15 locations (Sensitive Receptors along the elevated section)
Vibration	Vibration level Vrms	24hours Once/year For 3years	15 locations (Sensitive Receptors along the elevated and underground section)
Ecology	Bird Strike	4times/year(If no bird hit is reported in this duration, then this monitoring may be discontinued, else it will continue). From the beginning, DMRC will instruct its train operator to compulsorily blow the horn while on the bridge across the Yamuna.	On the DMRC Yamuna bridge near Okhla Bird Sanctuary

2.1 During Construction

When a measured value exceeds the standards, the value is written in bold letters.

Air Quality (Ambient Air Quality)

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)

PM ₁₀	µg/m ³			100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC
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Date: September 2021 Location: CC-136 (Halt Platform at Punjabi bagh) (Elevated)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country 's Standar ds	Referred Internation al Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	-	-	100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country 's Standar ds	Referred Internation al Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	-	-	100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	-	-	100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC

Ground Water Quality (Drinking Water Quality: IS 10500:1991)

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color, Hazen units, Max		-	-	5(25)	-	20 locations Once/6 months
Odour	-	-	-	Unobjectionable	-	
Taste	-	-	-	Agreeable	-	During entire civil construction stage or even later, if directed by DMRC
Turbidity, NTU, Max	-	-	-	5(10)	-	
pH Value	-	-	-	6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l	-	-	300(600)	-	
Iron (as Fe), max	mg/l	-	-	0.3(1.0)	-	
Chloride (as Cl), Max	mg/l	-	-	250(1000)	-	
Residual free Chlorine, Min	mg/l	-	-	0.2	-	
Fluoride (as F), Max	mg/l	-	-	1.0(1.5)	-	
Dissolved solids, Max	mg/l	-	-	500(2000)	-	

Calcium(as Ca), Max	mg/l	-	-	75(200)	-
Magnesium(as Mg), Max	mg/l	-	-	30(100)	-
Copper(as Cu), Max	mg/l	-	-	0.05(1.5)	-
Manganese(as Mn), Max	mg/l	-	-	0.1(0.3)	-
Sulphate(as SO ₄), Max	mg/l	-	-	200(400)	-
Nitrate(as NO ₂), Max	mg/l	-	-	45(100)	-
Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l	-	-	0.001(0.002)	-
Mercury(as Hg), Max	mg/l	-	-	0.001	-
Cadmium(as Cd), Max	mg/l	-	-	0.01	-
Selenium(as Se), Max	mg/l	-	-	0.01	-
Arsenic(as As), Max	mg/l	-	-	0.05	-
Cyanide(as CN), Max	mg/l	-	-	0.05	-
Lead(as Pb), Max	mg/l	-	-	0.05	-
Zinc(as Zn), Max	mg/l	-	-	5(15)	-
Anionic Detergents (as MBAS),Max	mg/l	-	-	0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l	-	-	0.05	-
Polynuclear aromatic hydrocarbons(as PAH),Max	mg/l	-	-	-	-
Mineral Oil	mg/l	-	-	0.01	-
Pesticides, Max	mg/l	-	-	Absent	-
Radioactive Materials,	Bq/l	-	-	-(0.1)	-

Max a) Alpha emitters						
Radioactive Materials, Max b) Beta emitters	Pci/l	-	-	-(1)	-	
Alkalinity, Max	mg/l	-	-	200(600)	-	
Aluminum(as Al), Max	mg/l	-	-	0.03(0.2)	-	
Boron,Max	mg/l	-	-	1(5)	-	

Date:

Location:

Item	Unit	Measure d Value (Mean)	Measured Value (Max.)	Country's Standards	Referred Internation al Standards	Remarks (Measurem ent Point, Frequency, Method, etc.)
Color,Hazen units,Max		-	-	5(25)	-	20 locations Once/6 months
Odour	-	-	-	Unobjection able	-	
Taste	-	-	-	Agreeable	-	During entire civil constructio n stage or even later, if directed by DMRC
Turbidity,NTU ,Max	-	-	-	5(10)	-	
pH Value	-	-	-	6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l	-	-	300(600)	-	
Iron(as Fe) ,max	mg/l	-	-	0.3(1.0)	-	
Chloride(as Cl), Max	mg/l	-	-	250(1000)	-	
Residual free Chlorine, Min	mg/l	-	-	0.2	-	
Fluoride(as F ⁻), Max	mg/l	-	-	1.0(1.5)	-	
Dissolved solids, Max	mg/l	-	-	500(2000)	-	
Calcium(as Ca), Max	mg/l	-	-	75(200)	-	
Magnesium(as Mg), Max	mg/l	-	-	30(100)	-	

Copper(as Cu), Max	mg/l	-	-	0.05(1.5)	-
Manganese(as Mn), Max	mg/l	-	-	0.1(0.3)	-
Sulphate(as SO ₄), Max	mg/l	-	-	200(400)	-
Nitrate(as NO ₂), Max	mg/l	-	-	45(100)	-
Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l	-	-	0.001(0.002)	-
Mercury(as Hg), Max	mg/l	-	-	0.001	-
Cadmium(as Cd), Max	mg/l	-	-	0.01	-
Selenium(as Se), Max	mg/l	-	-	0.01	-
Arsenic(as As), Max	mg/l	-	-	0.05	-
Cyanide(as CN), Max	mg/l	-	-	0.05	-
Lead(as Pb), Max	mg/l	-	-	0.05	-
Zinc(as Zn), Max	mg/l	-	-	5(15)	-
Anionic Detergents (as MBAS),Max	mg/l	-	-	0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l	-	-	0.05	-
Polynuclear aromatic hydrocarbons(as PAH),Max	mg/l	-	-	-	-
Mineral Oil	mg/l	-	-	0.01	-
Pesticides, Max	mg/l	-	-	Absent	-
Radioactive Materials, Max c) Alpha emitters	Bq/l	-	-	-(0.1)	-
Radioactive Materials,	Pci/l	-	-	-(1)	-

Max d) Beta emitters						
Alkalinity, Max	mg/l	-	-	200(600)	-	
Aluminum(as Al), Max	mg/l	-	-	0.03(0.2)	-	
Boron,Max	mg/l	-	-	1(5)	-	

Date:Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color,Hazen units,Max		-	-	5(25)	-	20 locations Once/6 months During entire civil construction stage or even later, if directed by DMRC
Odour	-	-	-	Unobjectionable	-	
Taste	-	-	-	Agreeable	-	
Turbidity,NTU,Max	-	-	-	5(10)	-	
pH Value	-	-	-	6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l	-	-	300(600)	-	
Iron(as Fe),max	mg/l	-	-	0.3(1.0)	-	
Chloride(as Cl), Max	mg/l	-	-	250(1000)	-	
Residual free Chlorine, Min	mg/l	-	-	0.2	-	
Fluoride(as F), Max	mg/l	-	-	1.0(1.5)	-	
Dissolved solids, Max	mg/l	-	-	500(2000)	-	
Calcium(as Ca), Max	mg/l	-	-	75(200)	-	
Magnesium(as Mg), Max	mg/l	-	-	30(100)	-	
Copper(as Cu), Max	mg/l	-	-	0.05(1.5)	-	
Manganese(as Mn), Max	mg/l	-	-	0.1(0.3)	-	

Sulphate(as SO ₄), Max	mg/l	-	-	200(400)	-
Nitrate(as NO ₂), Max	mg/l	-	-	45(100)	-
Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l	-	-	0.001(0.002)	-
Mercury(as Hg), Max	mg/l	-	-	0.001	-
Cadmium(as Cd), Max	mg/l	-	-	0.01	-
Selenium(as Se), Max	mg/l	-	-	0.01	-
Arsenic (as As), Max	mg/l	-	-	0.05	-
Cyanide(as CN), Max	mg/l	-	-	0.05	-
Lead(as Pb), Max	mg/l	-	-	0.05	-
Zinc(as Zn), Max	mg/l	-	-	5(15)	-
Anionic Detergents (as MBAS),Max	mg/l	-	-	0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l	-	-	0.05	-
Polynuclear aromatic hydrocarbons(as PAH),Max	mg/l	-	-	-	-
Mineral Oil	mg/l	-	-	0.01	-
Pesticides, Max	mg/l	-	-	Absent	-
Radioactive Materials, Max e) Alpha emitters	Bq/l	-	-	-(0.1)	-
Radioactive Materials, Max f) Beta emitters	Pci/l	-	-	-(1)	-
Alkalinity, Max	mg/l	-	-	200(600)	-
Aluminum(as	mg/l	-	-	0.03(0.2)	-

Al), Max						
Boron,Max	mg/l	-	-	1(5)	-	

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color,Hazen units,Max		-	-	5(25)	-	20 locations Once/6 months
Odour	-	-	-	Unobjectionable	-	
Taste	-	-	-	Agreeable	-	During entire civil construction stage or even later, if directed by DMRC
Turbidity,NTU,Max	-	-	-	5(10)	-	
pH Value	-	-	-	6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l	-	-	300(600)	-	
Iron(as Fe),max	mg/l	-	-	0.3(1.0)	-	
Chloride(as Cl), Max	mg/l	-	-	250(1000)	-	
Residual free Chlorine, Min	mg/l	-	-	0.2	-	
Fluoride(as F), Max	mg/l	-	-	1.0(1.5)	-	
Dissolved solids, Max	mg/l	-	-	500(2000)	-	
Calcium(as Ca), Max	mg/l	-	-	75(200)	-	
Magnesium(as Mg), Max	mg/l	-	-	30(100)	-	
Copper(as Cu), Max	mg/l	-	-	0.05(1.5)	-	
Manganese(as Mn), Max	mg/l	-	-	0.1(0.3)	-	
Sulphate(as SO ₄), Max	mg/l	-	-	200(400)	-	
Nitrate(as NO ₂), Max	mg/l	-	-	45(100)	-	

Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l	-	-	0.001(0.002)	-
Mercury(as Hg), Max	mg/l	-	-	0.001	-
Cadmium(as Cd), Max	mg/l	-	-	0.01	-
Selenium(as Se), Max	mg/l	-	-	0.01	-
Arsenic (as As), Max	mg/l	-	-	0.05	-
Cyanide(as CN), Max	mg/l	-	-	0.05	-
Lead(as Pb), Max	mg/l	-	-	0.05	-
Zinc(as Zn), Max	mg/l	-	-	5(15)	-
Anionic Detergents (as MBAS),Max	mg/l	-	-	0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l	-	-	0.05	-
Polynuclear aromatic hydrocarbons(as PAH),Max	mg/l	-	-	-	-
Mineral Oil	mg/l	-	-	0.01	-
Pesticides, Max	mg/l	-	-	Absent	-
Radioactive Materials, Max g) Alpha emitters	Bq/l	-	-	-(0.1)	-
Radioactive Materials, Max h) Beta emitters	Pci/l	-	-	-(1)	-
Alkalinity, Max	mg/l	-	-	200(600)	-
Aluminum(as Al), Max	mg/l	-	-	0.03(0.2)	-
Boron,Max	mg/l	-	-	1(5)	-

Noise / Vibration

Date: Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (L _{eq}) and L _{max}	dB(A)	-	-	<p><u>National Standards</u> <u>Area L_{eq}(d) L_{eq}(n)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40</p> <p><u>DMRC Env Manual</u> (when pre construction levels are not known) Resi L_{max} Daytime: 75 Nighttime: 65 Comm & Indstl At all time: 85</p>	Commercial /residence	<p>30 locations 24 hours/time Once/week</p> <p>During entire civil construction stage or even later, if directed by DMRC</p>
Vibration level	RMS (mm/s)	-	--	<p>Structures in good condition: 25 in fair condition: 12 in poor condition: 5 Water supply Structures: 5 Heritage structure/ Bridge structures: 5</p>	-	<p>10 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC</p>

Date:

Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (L _{eq}) and L _{max}	dB(A)	-	-	<u>National Standards</u> <u>Area</u> L _{eq} (d) L _{eq} (n) Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env</u> <u>Manual</u> (when pre construction levels are not known) Resi L _{max} Daytime: 75 Nighttime: 65 Comm & Indstl At all time: 85	Commercial / residence	30 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC
Vibration level	RMS (mm/s)	-	-	Structures in good condition: 25 in fair condition: 12 in poor condition: 5 Water supply Structures: 5 Heritage structure/ Bridge structures: 5	-	10 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC

Date:Location:

Item	Unit	Measured Value (Leq)	Measured Value (LMax)	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)	-	-	<u>National Standards</u> <u>AreaLeq(d)Leq(n)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env Manual</u> (when pre construction levels are not known) ResiLmax Daytime: 75 Nighttime: 65 Comm & Indstl and At all time: 85	Commercial / residence	30locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC
Vibration level	RMS (mm/s)	-	-	Structures in good condition:25 in fair condition:12 in poor condition:5 Water supply Structures:5 Heritage structure/ Bridge structures:5		10locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC

Date:Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)	Leq (d)- Leq (n)- Lmin-	-	<u>National Standards</u> <u>AreaLeq(d)Leq(n)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env</u> <u>Manual</u> (when pre construction levels are not known) ResiLmax Daytime: 75 Nighttime: 65 Comm & and Indstl At all time: 85	Commercial / residence	30locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC
Vibration level	RMS (mm/s)	-	-	Structures in good condition:25 in fair condition:12 in poor condition:5 Water supply Structures:5 Heritage structure/ Bridge structures:5	-	10locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC

Excavated soil (Leaching test)

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Mercury(as Hg)	mg/l	-	-	-	0.0005	In each Underground Construction Contract Once/6months During entire civil construction stage Samples should be taken from the underground lowest point. -Report submitted in last quarter report of July to September 2020
Cadmium(as Cd)	mg/l	-	-	-	0.01	
Arsenic(as As)	mg/l	-	-	-	0.01	
Cyanide(as CN)	mg/l	-	-	-	Not detected	
Lead(as Pb)	mg/l	-	-	-	0.01	
Chromium(as Cr6+)	mg/l	-	-	-	0.05	

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Mercury(as Hg)	mg/l	--	-	-	0.0005	In each Underground Construction Contract Once/6months During entire civil construction stage Samples should be taken from the underground lowest point.
Cadmium(as Cd)	mg/l	-	-	-	0.01	
Arsenic(as As)	mg/l	-	-	-	0.01	
Cyanide(as CN)	mg/l	-	-	-	Not detected	
Lead(as Pb)	mg/l	-	-	-	0.01	
Chromium(as Cr6+)	mg/l	-	-	-	0.05	

Excavated soil (Amount)

Line	<u>Excavated Amount</u> Approx.('000 m ³)	Name of Disposed Site	Disposed Amount Approx.('000 m ³)
Line-2	-	-	-
Line-6	-	-	-
Line-7	-	-	-
Line-8	-	-	-

Ecological Monitoring(Flora Monitoring)

CPM	Permissio n to fell trees	No. of trees actually felled	No of trees planted	No of trees transpla nted	Location of plantation
CPM-1	-	-	-	-	
CPM-2	-	-	-	-	
CPM-3	-	-	-	-	
CPM-4	-	-	-	-	
CPM-5	-	-	-	-	
CPM-6	-	-	-	-	
CPM-7	-	-	-	-	
CPM-8	-	-	-	-	
CPM-9	-	-	-	-	
CPM-10	-	-	-	-	
ED/Civil	-	-	-	-	

2.2 During Operation

When a measured value exceeds the standards, the value is written in bold letters.

Air Quality (Ambient Air Quality)

Date:June 2022Location:Karkarduma (Line-7)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	209	304	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	229	229	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO ₂	µg/m ³	18.7	18.7	80	IS 5182	24 Hours

					(Part 21)	
NO _x	µg/m ³	125.4	125.4	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: Noida Sector-34 (Line-3)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	192.5	274	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	129	129	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	26	26	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	10.7	10.7	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: Shaheed Sthal (Line-1)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	198	211	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	88	88	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	30.8	30.8	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	75.1	75.1	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: NHPC Chowk (Line-6)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	174	194	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	152	152	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	7.4	7.4	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	21.6	21.6	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date:June 2022Location:Okhla NSIC (Line-8)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	196.5	252	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	118	118	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	13.9	13.9	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	22.5	22.5	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date:June 2022Location:Hauz Khas (Line-8)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	162	170	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	103	103	60	IS 5182 (Part 24)	24 Hours Once in a month for three year

SO _x	µg/m ³	11.1	11.1	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	14.5	14.5	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: Nangli (Line-9)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	231	237	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	127	127	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	12.1	12.1	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	21.7	21.7	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: Ghevra (Line-5)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	213	313	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	186	186	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	36	36	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	62.1	62.1	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date: June 2022 Location: ESI Hospital (Line-7)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	208	277	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	174	174	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	28.4	28.4	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	48.9	48.9	80	IS 5182 (Part 6)	Once in a month for three year

Air Quality (Ambient Air Quality)

Date:June 2022Location:BadliMor(Line-2)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	264	267	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years
PM _{2.5}	µg/m ³	154	154	60	IS 5182 (Part 24)	24 Hours Once in a month for three year
SO _x	µg/m ³	36.1	36.1	80	IS 5182 (Part 21)	24 Hours
NO _x	µg/m ³	54.3	54.3	80	IS 5182 (Part 6)	Once in a month for three year

Effluentat Depot

Date:July 2022Location:Vinod Nagar Depot(Line-8)

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-	7.18	7.32	-	5.5-9.0	IS 3025(part-11) 1983-RA:2017	(Depot) Once/4months For 3 years
TSS	mg/l	105	1580	-	100	IS 3025(part-17) 1984-	

						RA:2017	
BOD	mg/l	68	22	-	30	IS 3025(part-44)) 1993- RA:2017	
COD	mg/l	254	118	-	250	IS 3025(part-58)) 2006- RA:2017	
Oil/Grease	mg/l	12	6.0	-	10	IS 3025(part-11)) 1991- RA:2019	

Effluent at Depot

Date: July 2022 Location: Ajrona Depot(Line-6)

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-	7.68	7.54	-	5.5-9.0	IS 3025(part-11)) 1983- RA:2017	(Depot) Once/4 months For 3 years
TSS	mg/l	280	36	-	100	IS 3025(part-17)) 1984- RA:2017	
BOD	mg/l	480	19	-	30	IS 3025(part-44)) 1993- RA:2017	
COD	mg/l	1692	90	-	250	IS 3025(part-58)) 2006- RA:2017	
Oil/Grease	mg/l	16	3	-	10	IS 3025(part-11)) 1991- RA:2019	

Effluent at Depot

Date: July 2022 Location: Kalindi Kunj Depot (Line-7)

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-	7.53	8.12	-	5.5-9.0	IS 3025(part-11) 1983-RA:2017	(Depot) Once/4months For 3 years
TSS	mg/l	132	32	-	100	IS 3025(part-17) 1984-RA:2017	
BOD	mg/l	126	28	-	30	IS 3025(part-44) 1993-RA:2017	
COD	mg/l	468	150	-	250	IS 3025(part-58) 2006-RA:2017	
Oil/Grease	mg/l	12	4.5	-	10	IS 3025(part-11) 1991-RA:2019	

Ground Water Quality(Drinking Water Quality:IS 10500:1991)

Date: June 2022 Location: Kalindikunj Depot

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards (IS 10500:1991)	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Turbidity, NTU, Max	-	1.5	-	5(10)	IS:3025(part-10)	
pH Value	-	7.05	-	6.5-8.5	IS:3025(part-11)	
Total Hardness (as CaCO ₃), Max	mg/l	453	-	300(600)	IS:3025(part-21)	
Iron(as Fe), max	mg/l		-	0.3(1.0)	IS:3025(part-53)	
Dissolved solids, Max	mg/l		-	500(2000)	IS:3025(part-16)	
Calcium(as Ca), Max	mg/l	90.6	-	75(200)	IS:3025(part-40)	
Magnesium(as	mg/l	55.0	-	30(100)	IS:3025(part-46)	

Mg), Max)	
Sulphate(as SO ₄), Max	mg/l	82	-	200(400)	IS:3025(part-24)	
Nitrate(as NO ₂), Max	mg/l	22	-	45(100)	IS:3025(part-34)	
Lead(as Pb), Max	mg/l	BDL	-	0.05	IS:3025(part-47)	
Zinc(as Zn), Max	mg/l	BDL	-	5(15)	IS:3025(part-49)	
Alkalinity, Max	mg/l	413	-	200(600)	IS:3025(part-23)	
Aluminum(as Al), Max	mg/l	-	-	0.03(0.2)	IS:3025(part-)	
TSS	mg/l	-	-	600	IS:3025(part-)	

Noise / Vibration

Date: September 2022 Location: Jasola Vihar Shaheen Bagh (Line-8)

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)	Leq (d)-60.8 Leq (n)- 58.5 Lmin-45.2	93.8	<u>National Standards</u> <u>Area Leq(d) Leq(n)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40	Commercial/residence	15 locations 24 hours/time Once/month

Date: Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)	Leq (d)- Leq (n)-		<u>National Standards</u> <u>Area Leq(d) Leq(n)</u> Resi 55 45		15 locations 24 hours/time Once/month

		Lmin-		Comm 55	65	Commerci al	
				Indstl 70	75	/residence	
				Silence 40	50		

Date: July 2022 Location: 5/3 Sarvapriya Vihar Hauz khas (Line-8)

Item	Unit	Measured RMS Value (Mean)	Measured RMS Value (Max.)	Country's Standards Max. PPV mm/s	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Vibration level	mm/s	72	78	Structures in:- Good condition = 25 Fair condition = 12 Poor condition = 5 Water supply structures = 5 Heritage structures = 5	Federal Transit Administration (FTA), US	As and when complaint arises at the ground floor of building above the tunnel.

Ecological Monitoring

Date: 30.09.2022 Location: Ohkla Bird Sanctuary Metro Station

Duration: From 01.07.2022 to 30.09.2022

Item	Number of Interviews with Train Operators who reported the accident during the monitoring period	Number of Accidents Reported during the monitoring period	Name of Species lost in the accident	Remarks (Place of accident, frequency, Method, etc.)
Train Accidents involving bird fatality	0	0	0	4 times/year For 2 years Visual observation (If no bird hit is reported in this duration, then

				<p>this monitoring may be discontinued, else it will continue). From the beginning, DMRC will instruct its train operator to compulsorily blow the horn while on the bridge across the Yamuna.</p>
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